EXCEL 2013

12 Using LOOKUP Functions, PivotTables, and Macros

LESSON OUTLINE

LEARNING OBJECTIVES

After studying this lesson, you will be able to:

- Create a lookup formula to locate a value or text in a list
- Create PivotTables and change their fields
- Create PivotCharts from PivotTable and worksheet data
- Set macro security to protect workbook data
- Record and run macros to automate tasks

In this lesson, you will learn about Excel features that can help you perform sophisticated data analyses. These features include the VLOOKUP and HLOOKUP functions, PivotTables, and PivotCharts. With the VLOOKUP and HLOOKUP functions, you use one piece of information to obtain another within a list. PivotTables let you summarize worksheet data dynamically so it can be viewed in various ways. PivotCharts provide this same power and flexibility within charts. Additionally, since many Excel workbooks are used on a recurring basis, with the same tasks being performed repeatedly, you will also create macros that can automate repetitive tasks.

CASE STUDY

Analyzing Data Efficiently

Green Clean, a janitorial product supplier and cleaning service contractor, works in conjunction with select charitable entities to raise funds for environmental causes. You would like to evaluate the overall performance of the company's fundraising team leaders. You would also like to examine the results of specific fundraising efforts that were overseen by these team leaders during the current year. You will use powerful data analysis tools—including the VLOOKUP function, PivotTables, and PivotCharts—to perform this analysis. You will also record macros to automate processes that will facilitate the analysis.

	A	B	C	D	E	F	G
4	**Team Leader**	**Goal**	**Amount Raised**	**Over (Under) Goal**	**Award Rate**	**Award Points**	**Achieved Goal?**
5	Abbott	$25,000	$31,810	$6,810	5%	1,591	Above Goal
6	Debowski	$100,000	$95,350	($4,650)	1%	954	Below Goal
7	Faber	$60,000	$52,500	($7,500)	0%	-	Under Achiever
8	Lemus	$100,000	$110,350	$10,350	7%	7,725	Over Achiever
9	Martinez	$70,000	$66,000	($4,000)	1%	660	Below Goal
10	Nguyen	$45,000	$48,000	$3,000	3%	1,440	At Goal
11	Park	$30,000	$31,680	$1,680	3%	950	At Goal
12	Weinstein	$70,000	$67,000	($3,000)	1%	670	Below Goal
13							
14							
15					**Over (Under) Goal**	**Award Rate**	**Message**
16					($100,000)	0%	Under Achiever
17					($5,000)	1%	Below Goal
18					$0	3%	At Goal
19					$5,000	5%	Above Goal
20					$10,000	7%	Over Achiever

The VLOOKUP function is used to populate the Award Rate and Achieved Goal? columns.

	A	B
3	**Row Labels**	**Sum of Year 2**
4	**Level 1**	**118,272,625**
5	Corporate Sponsorship	20,300,000
6	Federal Government Grant	47,894,948
7	Individual Sponsorship	15,000,000
8	State Government Grant	35,077,677
9	**Level 2**	**7,561,682**
10	Corporate Grant	1,425,000
11	Corporate Sponsorship	250,000
12	Individual Sponsorship	2,500,000
13	Medical Center/Large Facility	90,250
14	Medical Ctr Contribution	596,432
15	Organized Labor/Union Contribution	700,000
16	Private Grant	2,000,000
17	**Level 3**	**1,204,419**
18	**Level 4**	**85,500**
19	**Level 5**	**109,509**
20	**Level 6**	**6,827**
21	**Grand Total**	**127,240,562**

This PivotTable illustrates one of many ways in which the data can be organized.

Introducing Lookup Functions

Video Library http://labyrinthelab.com/videos Video Number: EX13-V1201

The lookup functions VLOOKUP (Vertical Lookup) and HLOOKUP (Horizontal Lookup) are used to retrieve a piece of data from a lookup table located within the same worksheet, a separate worksheet, or a different workbook.

	E	F
15	**Over (Under) Goal**	**Award Rate**
16	($100,000)	0%
17	($5,000)	1%
18	$0	3%
19	$5,000	5%
20	$10,000	7%

	A	B	C	D	E	F
15	**Over (Under) Goal**	($100,000)	($5,000)	$0	$5,000	$10,000
16	**Award Rate**	0%	1%	3%	5%	7%

The same data arranged in a vertical lookup table (left) and a horizontal lookup table (right)

LOOKUP Function Syntax

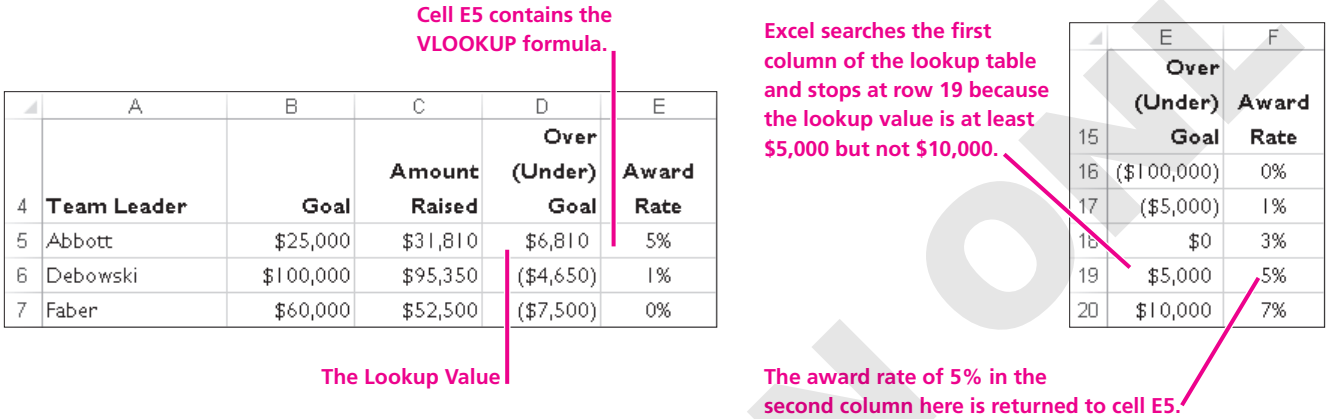
The structure of the VLOOKUP and HLOOKUP functions is VLOOKUP *or* HLOOKUP(lookup value,table array,column (or row) index number,[range lookup]).

VLOOKUP FUNCTION ARGUMENTS

Argument	Description
Lookup value	The value in the worksheet to be looked up in the first column of the table array
Table array	The cell range containing the lookup table, which may be expressed as absolute cell references or a defined name
Column index number	The column number in the table array that contains the corresponding data to be retrieved
Range lookup	Optional; a logical value that specifies a search for an exact or approximate value in the table array (TRUE, the default) or an exact match only (FALSE)

How the VLOOKUP Function Works

In the formula =VLOOKUP(D5,Award_Table,2), cell D5 contains the lookup value, the defined name *Award_Table* indicates the table array in which the search takes place, and the number 2 (the column index number) indicates that the corresponding award rate will be retrieved from the second column of the lookup table. The search is conducted down the first column of the table array until the highest value not greater than the lookup value is located.



	A	B	C	D	E
4	**Team Leader**	**Goal**	**Amount Raised**	**Over (Under) Goal**	**Award Rate**
5	Abbott	$25,000	$31,810	$6,810	5%
6	Debowski	$100,000	$95,350	($4,650)	1%
7	Faber	$60,000	$52,500	($7,500)	0%

	E	F
15	**Over (Under) Goal**	**Award Rate**
16	($100,000)	0%
17	($5,000)	1%
18	$0	3%
19	$5,000	5%
20	$10,000	7%

When a lookup formula will be copied to other cells, the cell range of the table array should be expressed in the formula as a defined name or absolute cell references.

Specifying the Range Lookup Argument

In our example, Excel uses the default range lookup argument TRUE so the search is conducted in the first column of the table array for either an exact match of $6,810 or the closest value not greater than $6,810. At times, you may want to search only for an exact match of the lookup value. The formula =VLOOKUP(D5,Award_Table,2,FALSE) includes the FALSE range lookup argument. This restricts the search to an exact match. Using our example, since the first column of the table array ($E$16:$F$20) does not contain the exact lookup value of $6,810, Excel would display #N/A in the formula cell.

Sorting a Table Array

The rows in the table array must be sorted in lowest to highest (A to Z) order in the first column when the TRUE range lookup argument is used. This way, you can be assured that VLOOKUP will stop at the proper row and return the correct value. Sorting the table array is not required when the FALSE range lookup argument is used.

DEVELOP YOUR SKILLS EX12-D01

Use VLOOKUP

In this exercise, you will set up a three-column table array and use the VLOOKUP function to calculate award points and display messages.

1. Open **EX12-D01-Awards** from the **EX2013 Lesson 12** folder and save it as **`EX12-D01-Awards-[FirstInitialLastName]`**.
   Replace the bracketed text with your first initial and last name. For example, if your name is Bethany Smith, your filename would look like this: EX12-D01-Awards-BSmith.

2. Display the **December** worksheet. Complete the table array in the **range E15:G20** by entering the numbers and text shown.
   Use a minus sign to enter the negative numbers in the range E16:E17.

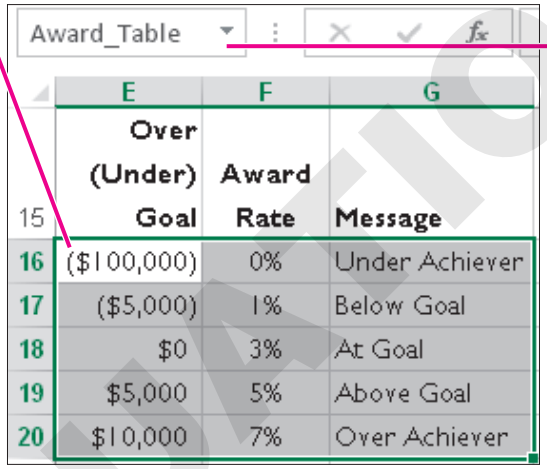
	E	F	G
15	Over (Under) Goal	Award Rate	Message
16	($100,000)	0%	Under Achiever
17	($5,000)	1%	Below Goal
18	$0	3%	At Goal
19	$5,000	5%	Above Goal
20	$10,000	7%	Over Achiever

3. Follow these steps to create the range name:

   Ⓐ Select the **range E16:G20**.

   Ⓑ Type **`Award_Table`** in the **Name box**.

   Ⓒ Tap Enter.



4. Select **cell E5** and enter the formula **`=VLOOKUP(D5,Award_Table,2)`**.
   The 5 percent award rate is returned from the lookup table to cell E5.

5. Use **AutoFill** to copy the formula from **cell E5** down to the **range E6:E12**.

6. Select **cell E7** and review the formula in the Formula Bar.
   The award rate returned from the lookup table is 0 percent. Notice that all arguments are the same for this function as the formula in cell E5, except that the relative cell reference instructs the VLOOKUP to look up the value from cell D7.

7. Type **`=C5*E5`** in **cell F5** and use **AutoFill** to copy the commission formula to the **range F6:F12**.
   The result in cell F5 is 1,591.

8. Select **cell G5**, enter the function `=VLOOKUP(D5,Award_Table,3)`, and use **AutoFill** to copy the quota message formula to the **range G6:G12**.

   You used the same arguments for this function that you did in cell E5 except that the last argument is 3 instead of 2. This instructs VLOOKUP to return the message text from column 3 of the table array. Rows 4–20 should match the following illustration.

	A	B	C	D	E	F	G
4	**Team Leader**	**Goal**	**Amount Raised**	**Over (Under) Goal**	**Award Rate**	**Award Points**	**Achieved Goal?**
5	Abbott	$25,000	$31,810	$6,810	5%	1,591	Above Goal
6	Debowski	$100,000	$95,350	($4,650)	1%	954	Below Goal
7	Faber	$60,000	$52,500	($7,500)	0%	-	Under Achiever
8	Lemus	$100,000	$110,350	$10,350	7%	7,725	Over Achiever
9	Martinez	$70,000	$66,000	($4,000)	1%	660	Below Goal
10	Nguyen	$45,000	$48,000	$3,000	3%	1,440	At Goal
11	Park	$30,000	$31,680	$1,680	3%	950	At Goal
12	Weinstein	$70,000	$67,000	($3,000)	1%	670	Below Goal
13							
14							
15					**Over (Under) Goal**	**Award Rate**	**Message**
16					($100,000)	0%	Under Achiever
17					($5,000)	1%	Below Goal
18					$0	3%	At Goal
19					$5,000	5%	Above Goal
20					$10,000	7%	Over Achiever

9. Select **cell F16** and change the rate to `1%`.

   The rate in cell E7 changed from 0 percent to 1 percent, and the corresponding award points in cell F7 are now 525.

10. Click **Undo** to change the entry back to 0% in cell F16.

11. Select **cell G16** and change the message to `Counsel`.

    Notice that the result in cell G7 changed to Counsel *because you changed the message in the lookup table.*

12. Click **Undo** to change the entry back to *Under Achiever.*

13. Save and then close the file.

Creating PivotTables

Video Library http://labyrinthelab.com/videos Video Number: EX13-V1202

PivotTables are powerful data analysis tools. They let you summarize data in various ways and instantly change the view you use. A PivotTable not only subtotals groups of related data; it also compares one group to another.

Arranging the Source Data

You create PivotTables from columns or from a table in an Excel worksheet. The data should contain no blank rows or columns. Converting a list to a table is recommended when records will be added after the PivotTable is created. The additional table data are included automatically within the PivotTable when it is refreshed or updated. Data in a list are not included automatically. The following examples explain two PivotTables based on the worksheet list partially shown here.

	A	B	C	D	E	F
3	Pledge Level	Team Leader	Sponsor Category	Sponsor Name	Year 1	Year 2
4	Level 5	Abbott	Organization Contribution	Accountancy Association	0	15,000
5	Level 4	Faber	Corporate Sponsorship	Accurate Biomedical	10,000	10,000
6	Level 1	Lemus	Federal Government Grant	Admin for Children & Fam	5,129,874	8,075,333
7	Level 3	Faber	Corporate Sponsorship	Alpha Supplies Corp.	125,000	50,000
8	Level 6	Nguyen	Individual Contribution	Andres Padilla	0	500

The worksheet data

PivotTable Example 1

You can sort the preceding table by pledge level or sponsor category, but you cannot easily compare totals for the various pledge levels in each sponsor category. A PivotTable can summarize some or all data in any number of ways, and it creates grand totals. Each column in a PivotTable is a field. Examine the PivotTable and notice that the Sponsor Category field from the table is used for the row labels, the Pledge Level field for the column labels, and the Year 2 field for the data area and grand totals. Each row displays the amount given by each sponsor group in the various pledge levels.

Sum of Year 2	Column Labels						
Row Labels	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Grand Total
Corporate Grant		1,425,000		0			1,425,000
Corporate Sponsorship	20,300,000	250,000	350,000	22,500	28,750		20,951,250
Federal Government Grant	47,894,948						47,894,948
Individual Contribution					4,100	2,080	6,180
Individual Sponsorship	15,000,000	2,500,000	413,579	15,000	4,475	595	17,933,649
Local Business Contribution					2,634	992	3,626
Local Government Grant			243,500				243,500
Medical Center/Large Facility		90,250					90,250
Medical Ctr Contribution		596,432	122,340				718,772
Organization Contribution			50,000	28,000	39,050	3,160	120,210
Organized Labor/Union Contribution		700,000					700,000
Physician Office Contribution			25,000	20,000	30,500		75,500
Private Grant		2,000,000	0				2,000,000
State Government Grant	35,077,677						35,077,677
Grand Total	**118,272,625**	**7,561,682**	**1,204,419**	**85,500**	**109,509**	**6,827**	**127,240,562**

This PivotTable summarizes contributions by sponsor category.

PivotTable Example 2

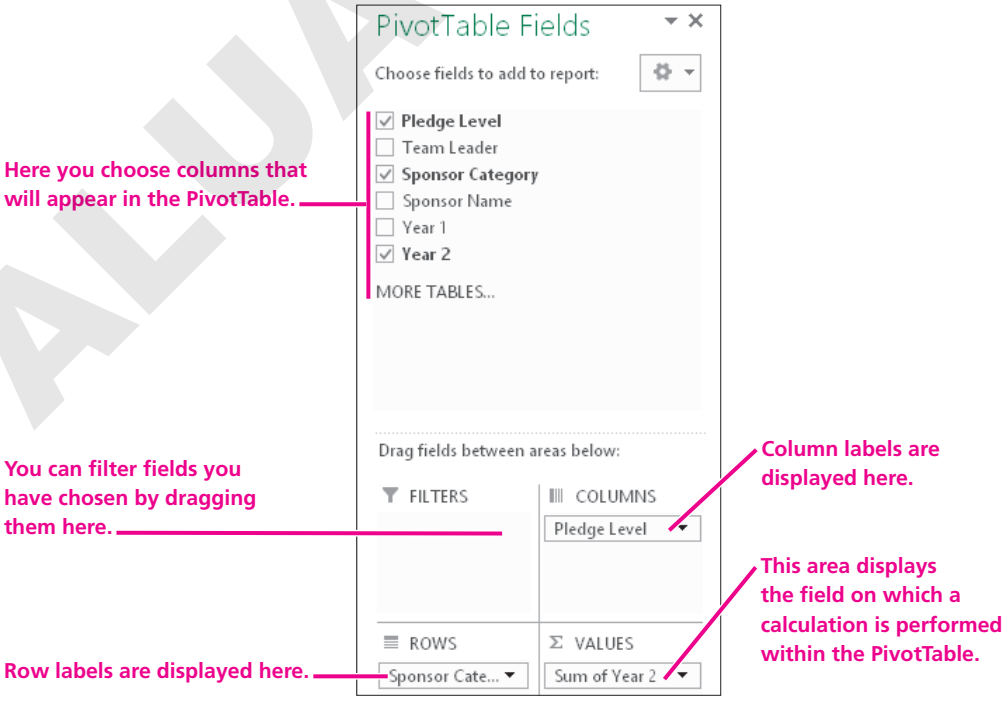
In this example, data is summarized first by pledge level and then by sponsor category. To create this type of view, the PivotTable layout shown in the following illustration contains the Pledge Level and then Sponsor Category fields for row labels, no column labels, and the Year 2 field for the data area and totals.

	A	B
3	**Row Labels**	**Sum of Year 2**
4	**⊟Level 1**	**118,272,625**
5	Corporate Sponsorship	20,300,000
6	Federal Government Grant	47,894,948
7	Individual Sponsorship	15,000,000
8	State Government Grant	35,077,677
9	**⊟Level 2**	**7,561,682**
10	Corporate Grant	1,425,000
11	Corporate Sponsorship	250,000
12	Individual Sponsorship	2,500,000
13	Medical Center/Large Facility	90,250
14	Medical Ctr Contribution	596,432
15	Organized Labor/Union Contribution	700,000
16	Private Grant	2,000,000
17	**⊞Level 3**	**1,204,419**
18	**⊞Level 4**	**85,500**
19	**⊞Level 5**	**109,509**
20	**⊞Level 6**	**6,827**
21	**Grand Total**	**127,240,562**

This PivotTable layout summarizes contributions first by pledge level and then by sponsor category.

How PivotTables Work

Each area of a PivotTable plays a role in data organization. The PivotTable Fields task pane displays after you define the worksheet range to be used. The areas of the task pane are explained in the following illustration, which displays the settings for PivotTable Example 1.



You must select a cell in the PivotTable to display the PivotTable Fields task pane.

Where you place fields within the PivotTable Fields task pane determines how the PivotTable summarizes the data. By choosing different fields or dragging and dropping a field, you can quickly compare data in various ways. You may choose from several functions—such as SUM, COUNT, and AVERAGE—to calculate fields containing values.

QUICK REFERENCE **CREATING A PIVOTTABLE**

Task	Procedure
Create a PivotTable from a worksheet range or table	■ Select a cell in the worksheet range/table and choose Insert→Tables→PivotTable. ■ Verify the worksheet range/table name, choose the PivotTable position, and click OK. ■ In the PivotTable Fields task pane, place a checkmark by each worksheet field to be included in order. ■ If necessary, drag and drop field names to the correct areas: Filters, Rows, Columns, or Values.
Name a PivotTable	■ Choose PivotTable Tools→Analyze→PivotTable. ■ Type the name in the PivotTable Name Box (spaces are allowed) and tap Enter.
Display the PivotTable Fields task pane	■ Select any cell within the PivotTable. ■ If the task pane is turned off, choose PivotTable Tools→Analyze→Show→Field List.

The Recommended PivotTables command offers various preset PivotTables. These can be accessed by choosing Insert→Tables→Recommended PivotTables.

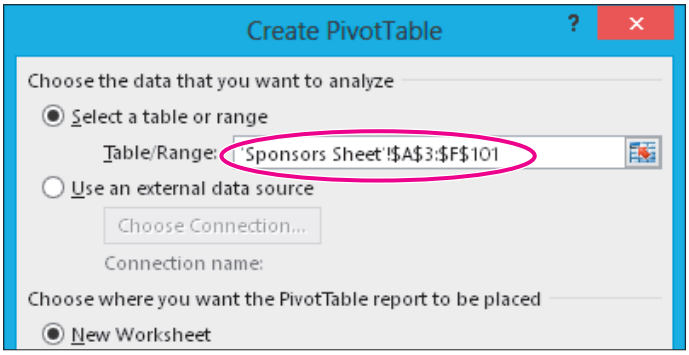
DEVELOP YOUR SKILLS EX12-D02

Create PivotTables

The best way to understand the dynamic capabilities of a PivotTable is to create one. In this exercise, you will create PivotTables from a worksheet range and a table.

1. Open **EX12-D02-Sponsors** from the **EX2013 Lesson 12** folder and save it as **`EX12-D02-Sponsors-[FirstInitialLastName]`**.
   You will create a PivotTable that summarizes Year 2 by pledge level with subtotals for each sponsor category.
2. Select **cell B4** and choose **Insert→Tables→PivotTable**.

3. Verify that the table/range agrees with the one displayed here, and then click **OK**.

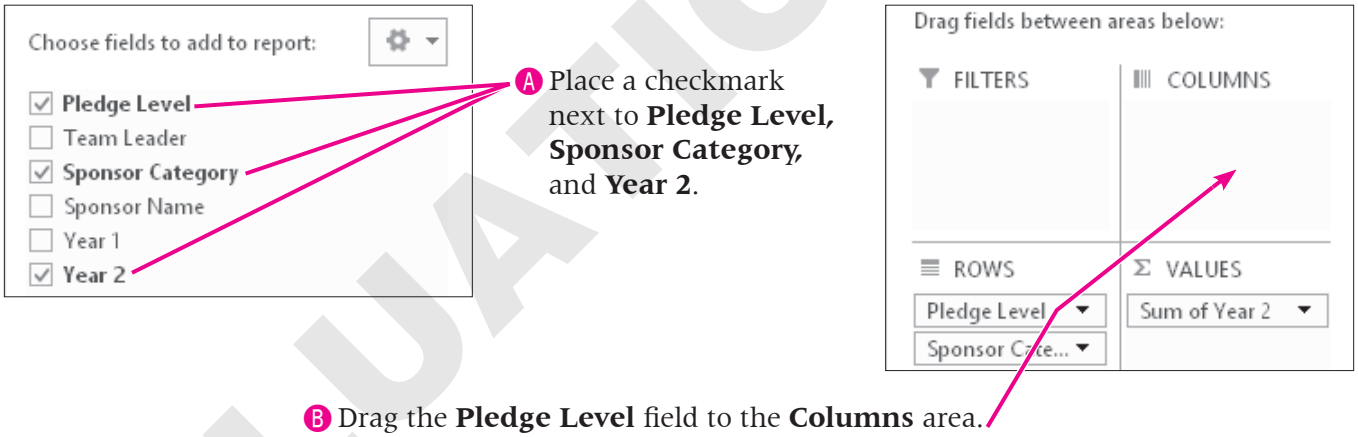


A new worksheet appears and contains an empty PivotTable placeholder. The PivotTable Fields task pane also displays. If the task pane is turned off, choose PivotTable Tools→Analyze→Show→Field List.

4. Rename Sheet1 to **`PivotTable by Sponsor Category`**, and then select **cell A1**.
   The PivotTable Fields task pane disappears when you select the cell, which is outside the boundary of the PivotTable outline.

5. Select **cell A3** to restore the task pane.

6. Follow these steps to define the PivotTable in the task pane:



A Place a checkmark next to **Pledge Level**, **Sponsor Category**, and **Year 2**.

B Drag the **Pledge Level** field to the **Columns** area.

In the PivotTable, notice that the sponsor categories are displayed one per row, the six pledge levels are displayed one per column, and the Year 2 contributions data are summarized with totals for each sponsor category in column H and each pledge level in row 19.

	A	B	C	D	E	F	G	H
3	Sum of Year 2	Column Labels						
4	Row Labels	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Grand Total
5	Corporate Grant		1425000		0			1425000
6	Corporate Sponsorship	20300000	250000	350000	22500	28750		20951250
7	Federal Government Grant	47894948						47894948
8	Individual Contribution					4100	2080	6180
9	Individual Sponsorship	15000000	2500000	413579	15000	4475	595	17933649
10	Local Business Contribution					2634	992	3626
11	Local Government Grant			243500				243500
12	Medical Center/Large Facility		90250					90250
13	Medical Ctr Contribution		596432	122340				718772
14	Organization Contribution			50000	28000	39050	3160	120210
15	Organized Labor/Union Contribution		700000					700000
16	Physician Office Contribution			25000	20000	30500		75500
17	Private Grant		2000000	0				2000000
18	State Government Grant	35077677						35077677
19	Grand Total	118272625	7561682	1204419	85500	109509	6827	127240562

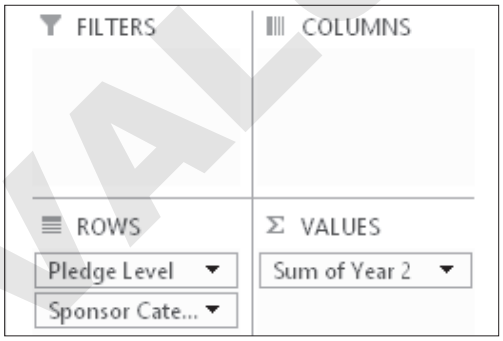
7. Choose **PivotTable Tools→Analyze→PivotTable→Options**.
8. Type **`BySponsorCategory`** in the PivotTable name text box and tap Enter.

Create a PivotTable from a Worksheet Table

The steps for creating a PivotTable from a worksheet table are the same as for a worksheet range. This time your PivotTable will group data by pledge level, with the sponsor categories in alphabetical order within each pledge level.

9. Display the **Sponsors Table** worksheet.
10. With any table cell selected, choose **Insert→Tables→PivotTable**, verify that the suggested range is the **Sponsors_Table**, and click **OK**.
11. Rename the new sheet **`PivotTable by Pledge Level`**. In the PivotTable Fields task pane, place a checkmark next to field names in this order: **Pledge Level, Sponsor Category, Year 2**.

    The records are grouped by pledge level, with the sponsor categories in alphabetical order within each pledge level. The Year 2 subtotal displays for each pledge level, and a grand total appears at the bottom of the column.



	A	B
3	Row Labels	Sum of Year 2
4	⊟Level 1	118,272,625
5	Corporate Sponsorship	20,300,000
6	Federal Government Grant	47,894,948
7	Individual Sponsorship	15,000,000
8	State Government Grant	35,077,677
9	⊟Level 2	7,561,682
10	Corporate Grant	1,425,000
11	Corporate Sponsorship	250,000

12. Choose **PivotTable Tools→Analyze→PivotTable→Options**.
13. Type **`ByPledgeLevel`** in the PivotTable name text box and tap Enter.
14. Save the file and leave it open; you will modify it throughout this lesson.

Formatting a PivotTable

Video Library http://labyrinthelab.com/videos Video Number: EX13-V1203

Values and subtotals in a PivotTable do not automatically display the formatting from the original worksheet cells. You may select and format one or more specific cells in the PivotTable using standard Ribbon commands. Alternatively, the PivotTable Tools Design contextual tab contains a large selection of PivotTable styles that can be used to quickly apply color, shading, and gridlines. The report layout displays in Compact Form by default, but you may choose from two other layouts. The subtotals may be displayed at the top or bottom of each group, or can be hidden.

	A	B
3	**Row Labels**	**Sum of Year 2**
4	**⊟Level 1**	**118272625**
5	Corporate Sponsorship	20300000
6	Federal Government Grant	47894948
7	Individual Sponsorship	15000000
8	State Government Grant	35077677
9	**⊟Level 2**	**7561682**
10	Corporate Grant	1425000

Compact form

	A	B	C
3	**Pledge Level**	**Sponsor Category**	**Sum of Year 2**
4	**⊟Level 1**	Corporate Sponsorship	20300000
5		Federal Government Grant	47894948
6		Individual Sponsorship	15000000
7		State Government Grant	35077677
8	**Level 1 Total**		**118272625**
9	**⊟Level 2**	Corporate Grant	1425000
10		Corporate Sponsorship	250000

Tabular form

QUICK REFERENCE **FORMATTING A PIVOTTABLE**

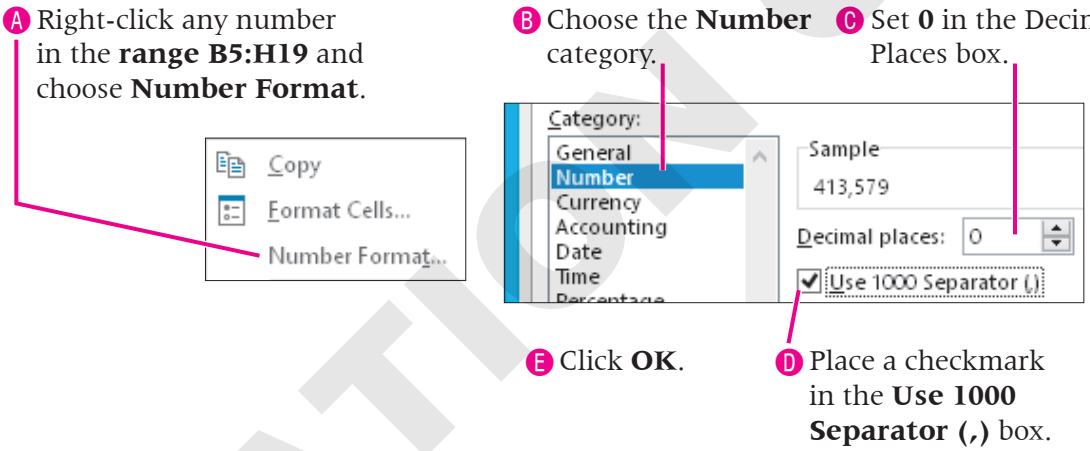
Task	Procedure
Apply number formatting to a field	Right-click a column cell in the PivotTable, choose Number Format, and choose options from the Format Cells dialog box. (Don't choose Format Cells, which formats the selection rather than entire columns.)
Change the subtotals or grand totals display	Choose PivotTable Tools→Design→Layout→Subtotals or Grand Totals and choose the desired option.
Apply a PivotTable style	Choose PivotTable Tools→Design→PivotTable Styles→More and choose the desired style.
Apply a report layout	Choose PivotTable Tools→Design→Layout→Report Layout and choose Compact (default), Outline, or Tabular.

DEVELOP YOUR SKILLS EX12-D03

Format a PivotTable

In this exercise, you will format selected cells, apply number formatting to values columns, choose a PivotTable style, and explore the report layout choices.

1. Save your file as **`EX12-D03-Sponsors-[FirstInitialLastName]`**.
2. Display the **PivotTable by Sponsor Category** worksheet, select the **range B4:H4**, and right-align the labels.
3. Choose **PivotTable Tools→Design→Layout→Grand Totals**. Experiment by choosing each option and observing its result, and then choose **On for Rows and Columns**.
4. Select any cell in the PivotTable.
5. Follow these steps to format the Year 2 contribution numbers:



All number columns are displayed with the formatting you chose because they all are part of the Sum of Year 2 field.

6. Display the **PivotTable by Pledge Level** worksheet.
7. Click in the PivotTable, choose **PivotTable Tools→Design→PivotTable Styles→More ▼**, and choose **Pivot Style Medium 9**.
   This style shades the subtotal rows.
8. Choose **PivotTable Tools→Design→Layout→Report Layout→Show in Outline Form**.
   This layout divides the Pledge Level and Sponsor Category fields into separate columns. Both column headings display a filter button.
9. Choose **PivotTable Tools→Design→Layout→Report Layout→Show in Tabular Form**.
   This layout displays a subtotal row below its detail rows.
10. Choose **PivotTable Tools→Design→Layout→Report Layout→Show in Compact Form** to return to the original layout.
11. Save the file and leave it open.

Changing PivotTable Fields

Video Library http://labyrinthelab.com/videos Video Number: EX13-V1204

You may add or remove fields on a PivotTable simply by adding or removing the checkmark next to the field name in the PivotTable Fields task pane. The PivotTable will automatically reconfigure to display the new data. You may also change the order of fields within the row and column areas. One of the most powerful ways of manipulating data is to move a field from the row area to the column area or vice versa. This is called *pivoting the field* (hence the name PivotTable). The display of the data field rotates to give you an entirely different view of your data, as illustrated in the two PivotTables you created in the previous exercise. There, you positioned the Pledge Level field to display as columns in the first PivotTable and as rows in the second.

	A	B	C	D	E	F	G	H
3	**Sum of Year 2**	**Column Labels**						
4	**Row Labels**	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**	**Grand Total**
5	Corporate Grant		1,425,000		0			1,425,000
6	Corporate Sponsorship	20,300,000	250,000	350,000	22,500	28,750		20,951,250
7	Federal Government Grant	47,894,948						47,894,948
8	Individual Contribution					4,100	2,080	6,180
9	Individual Sponsorship	15,000,000	2,500,000	413,579	15,000	4,475	595	17,933,649
10	Local Business Contribution					2,634	992	3,626
11	Local Government Grant			243,500				243,500
12	Medical Center/Large Facility		90,250					90,250
13	Medical Ctr Contribution		596,432	122,340				718,772
14	Organization Contribution			50,000	28,000	39,050	3,160	120,210
15	Organized Labor/Union Contribution		700,000					700,000
16	Physician Office Contribution			25,000	20,000	30,500		75,500
17	Private Grant		2,000,000	0				2,000,000
18	State Government Grant	35,077,677						35,077,677
19	**Grand Total**	**118,272,625**	**7,561,682**	**1,204,419**	**85,500**	**109,509**	**6,827**	**127,240,562**

Pledge Level fields displayed as columns

	A	B
3	**Row Labels**	**Sum of Year 2**
4	⊟**Level 1**	**118272625**
5	Corporate Sponsorship	20300000
6	Federal Government Grant	47894948
7	Individual Sponsorship	15000000
8	State Government Grant	35077677
9	⊟**Level 2**	**7561682**
10	Corporate Grant	1425000
11	Corporate Sponsorship	250000
12	Individual Sponsorship	2500000
13	Medical Center/Large Facility	90250
14	Medical Ctr Contribution	596432
15	Organized Labor/Union Contribution	700000
16	Private Grant	2000000
17	⊟**Level 3**	**1204419**
18	Corporate Sponsorship	350000
19	Individual Sponsorship	413579
20	Local Government Grant	243500
21	Medical Ctr Contribution	122340
22	Organization Contribution	50000
23	Physician Office Contribution	25000
24	Private Grant	0
25	⊟**Level 4**	**85500**
26	Corporate Grant	0
27	Corporate Sponsorship	22500
28	Individual Sponsorship	15000
29	Organization Contribution	28000
30	Physician Office Contribution	20000

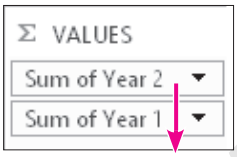
Pledge Level fields displayed as rows

DEVELOP YOUR SKILLS EX12-D04

Change PivotTable Fields

In this exercise, you will add fields to the PivotTable and reorder the field display. You will also pivot the view.

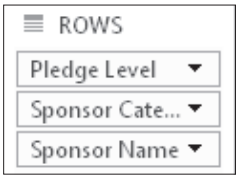
1. Save your file as **EX12-D04-Sponsors-[FirstInitialLastName]**.
2. Display the **PivotTable by Pledge Level** worksheet.
3. Place a checkmark next to **Year 1** in the task pane to add this field to the PivotTable.
   The Year 1 values are summed with subtotals and a grand total.
4. Right-click any cell in the **Sum of Year 1** column of the PivotTable and choose **Number Format**.
5. In the Format Cells dialog box, choose the **Number** category, set **0** decimal places, check the **Use 1000 Separator (,)** option, and click **OK**.
6. Repeat **steps 4–5** to format the **Sum of Year 2** column.
7. Drag **Sum of Year 2** below Sum of Year 1 in the Values area.



	A	B	C
3	Row Labels	Sum of Year 1	Sum of Year 2
4	Level 1	117,267,482	118,272,625
5	Corporate Sponsorship	17,460,000	20,300,000
6	Federal Government Grant	49,899,591	47,894,948
7	Individual Sponsorship	12,500,000	15,000,000
8	State Government Grant	37,407,891	35,077,677
9	Level 2	6,254,063	7,561,682
10	Corporate Grant	1,250,000	1,425,000
11	Corporate Sponsorship	250,000	250,000

The PivotTable now displays the columns for both years in the order listed in the Values area of the task pane.

8. Place a checkmark by the **Sponsor Name** field in the top section of the PivotTable Fields task pane.
   Notice the order of the fields in the Row Labels area. Now the sponsors and their contribution amounts are displayed within each sponsor category. Adding or deleting row labels allows you to control the level of detail displayed in a PivotTable.

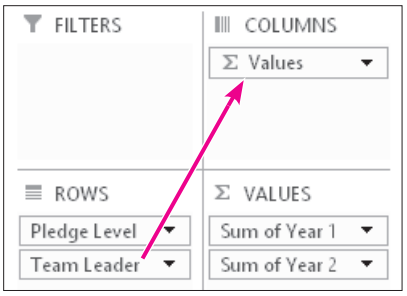


	A	B	C
3	Row Labels	Sum of Year 1	Sum of Year 2
4	Level 1	117,267,482	118,272,625
5	Corporate Sponsorship	17,460,000	20,300,000
6	Jensen Pharmaceutical	7,500,000	10,000,000
7	Medical Solutions Corp.	5,460,000	4,300,000
8	Open Systems	4,500,000	6,000,000
9	Federal Government Grant	49,899,591	47,894,948
10	Admin for Children & Fam	5,129,874	8,075,333

9. Remove the checkmark by the **Sponsor Category** and **Sponsor Name** fields in the PivotTable Fields task pane; add a checkmark next to **Team Leader**.

   The team leader totals appear within each pledge level. Notice that some team leaders appear in multiple pledge levels. This view makes it easy to compare Year 1 and Year 2 data.

10. Drag the **Team Leader** field from the Rows area to the **Columns** area below the Values field.



	A	B	C	D	E	F	G	H	I	J
3		Column Labels								
4		Sum of Year 1								Sum of Year 2
5	Row Labels	Abbott	Debowski	Faber	Lemus	Martinez	Nguyen	Park	Weinstein	Abbott
6	Level 1			17,460,000	87,307,482				12,500,000	
7	Level 2		750,000	250,000	2,000,000	754,063			2,500,000	
8	Level 3	50,000		412,000	350,000	207,250			298,333	50,000
9	Level 4	30,000		42,500	50,000	65,000			14,600	28,000
10	Level 5	14,000		20,000		12,500	5,200	2,262	4,325	39,050
11	Level 6	10,646					2,595	1,410	535	3,160
12	**Grand Total**	**104,646**	**750,000**	**18,184,500**	**89,707,482**	**1,038,813**	**7,795**	**3,672**	**15,317,793**	**120,210**

You just pivoted the team leader field to be displayed in columns rather than rows. Now you can compare each team leader's overall performance among the various pledge levels.

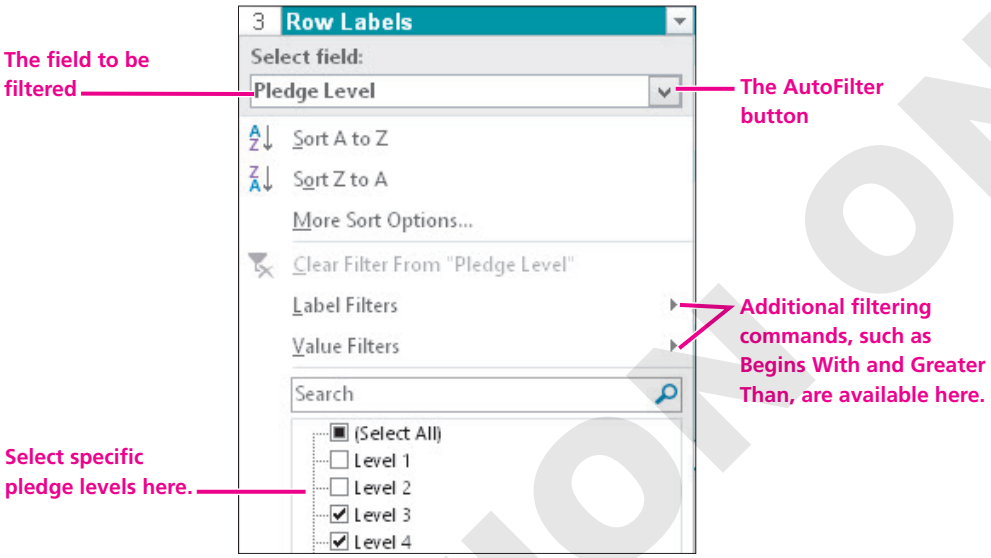
11. **Undo** the pivot.

12. Save the file and leave it open.

Filtering a PivotTable with AutoFilter

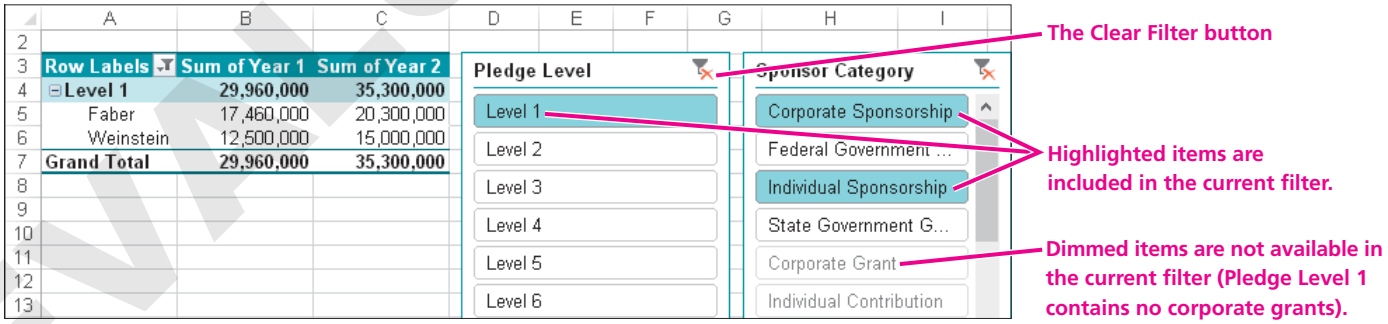
Video Library http://labyrinthelab.com/videos Video Number: EX13-V1205

You may set the PivotTable to filter, or include, specific items in the data summaries. The totals and subtotals are recalculated for the selected items. The Row Labels and Column Labels headings have an AutoFilter button that displays the same sorting and filtering options that are available on the columns of worksheet lists and tables.



Filtering PivotTables with Slicers

Slicers are menu frames displayed on worksheets that contain all filtering choices in one field. Selected items are highlighted in slicers, making it easy to identify currently applied criteria. Slicer frames may be resized, moved, and formatted with styles for a consistent appearance. Slicers may also be shared in other worksheets of the same workbook for use with multiple PivotTables based on the same data set. Changing the filtering selections in a shared slicer causes all connected PivotTables to update automatically.



QUICK REFERENCE **CHANGING PIVOTTABLE FIELD ORDER AND FILTERING PIVOTTABLE DATA**

Task	Procedure
Change the field order in rows/ columns	■ Drag a field name above/below another field in an area list at the bottom of the PivotTable Fields task pane.
Remove a field	■ Uncheck the field name from the PivotTable Fields task pane.
Filter for specific items using AutoFilter	■ Click the AutoFilter button next to Row (or Column) Labels, choose a field in the filtering list, and remove the checkmark from the desired item(s); or, choose Label Filters, Value Filters, or Date Filters, depending on the data type.
Filter for specific items using slicers	■ Select any PivotTable cell and choose PivotTable Tools→Analyze→Filter→Insert Slicer. ■ Place a checkmark next to the desired fields and click OK. ■ Choose one or more items in slicers, as desired. (To select multiple items, hold down Ctrl while clicking each item. To remove items from a multiple selection, hold down Ctrl while clicking items.)
Clear a filter from a slicer	■ Click the Clear Filter button.
Move and resize a slicer	■ Point to a slicer's frame or title bar and drag to the desired location on the worksheet. ■ Drag a corner or side handle on the slicer frame to resize the slicer.
Display slicer buttons in multiple columns	■ Select the slicer, choose Slicer Tools→Options→Buttons→Columns, and choose the number of columns.
Apply a style to a slicer	■ Select the slicer, choose Slicer Tools→Options→Slicer Styles→More, and choose a style.
Connect a slicer to additional PivotTables based on the same data set	■ Select the slicer and choose Slicer Tools→Options→Slicer→Report Connections. ■ Place a checkmark by the PivotTable name(s) to which you wish to connect the slicer and click OK.

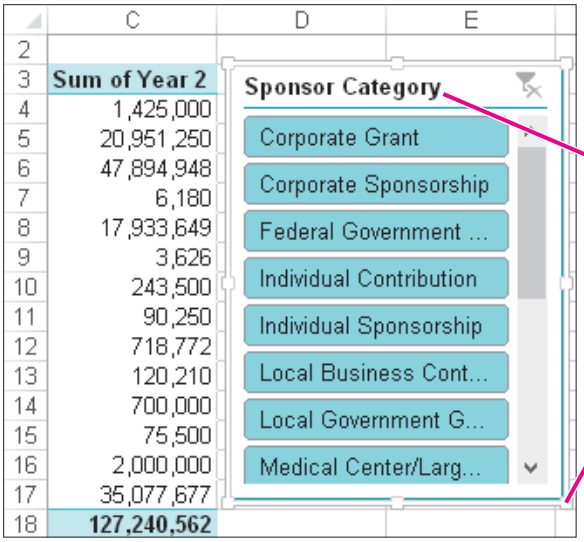
DEVELOP YOUR SKILLS EX12-D05

Filter a PivotTable with Slicers

In this exercise, you will display slicers on a PivotTable worksheet. You will move, resize, and format the slicers to fit around the PivotTable. Then, you will select items from the slicers to filter the PivotTable to look at the data in various ways.

1. Save your file as **`EX12-D05-Sponsors-[FirstInitialLastName]`**.
2. Display the **PivotTable with Slicers** worksheet.
   The PivotTable displays the Sponsor Categories field as rows and the Sum of Year 1 and Sum of Year 2 fields as columns.
3. Select any cell in the PivotTable and choose **PivotTable Tools→Analyze→Filter→Insert Slicer**.
4. Place a checkmark next to **Pledge Level, Team Leader,** and **Sponsor Category**; click **OK**.
5. Select **cell A1** to hide the PivotTable Fields task pane, if still displayed.

6. Follow these steps to move and resize the Sponsor Category slicer:

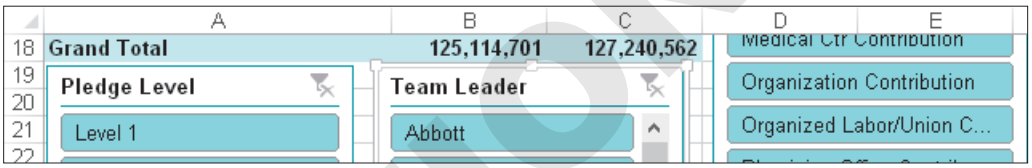


A If necessary, drag **Pledge Level** and **Team Leader** slicers away from columns D–E.

B Point at the **Sponsor Category's** title bar and drag the slicer to the right of the PivotTable.

C Point at the **lower-right corner handle** on the slicer frame and drag down and right to display all sponsor category names.

7. Drag the **Pledge Level** and **Team Leader** slicers to **row 19**.



8. Click the **Pledge Level** title to display the slicer's frame, and then hold down Shift and click the **Team Leader** title.

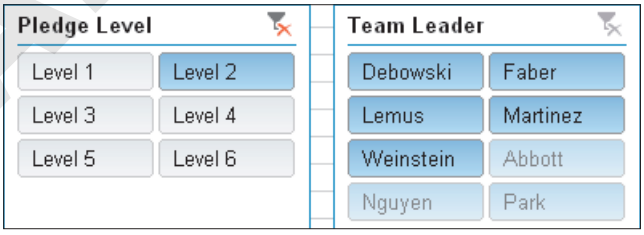
Frames appear around the two slicers to indicate that both are selected.

9. Choose **Slicer Tools→Options→Buttons→Columns** and change the number of columns to **2**.

10. Click the **Sponsor Category** title in the slicer at the right of the PivotTable, choose **Slicer Tools→Options→Slicer Styles→More**, and choose any style.

11. Apply the styles of your choice to the **Pledge Level** and **Team Leader** slicers.

12. Choose **Level 2** in the Pledge Level slicer.



The Team Leader slicer shows that Debowski, Faber, Lemus, Martinez, and Weinstein are included in the PivotTable totals. The buttons are dimmed for the other team leaders because they did not solicit any contributions at Pledge Level 2.

The seven sponsor categories with contributions at Level 2 are displayed in the PivotTable, matching the seven highlighted buttons in the Sponsor Category slicer.

13. Click the **Clear Filter** button on the Pledge Level slicer.
14. Select **Corporate Sponsorship** in the Sponsor Category slicer, hold down Ctrl, and select **Individual Sponsorship**.
    The PivotTable and slicers reflect the additional category.
15. Save the file and leave it open.

Editing PivotTable Calculations

Video Library http://labyrinthelab.com/videos Video Number: EX13-V1206

You are not limited to summing values in a PivotTable, and you may create formulas within PivotTables when necessary.

Changing the Function for a Values Area Item

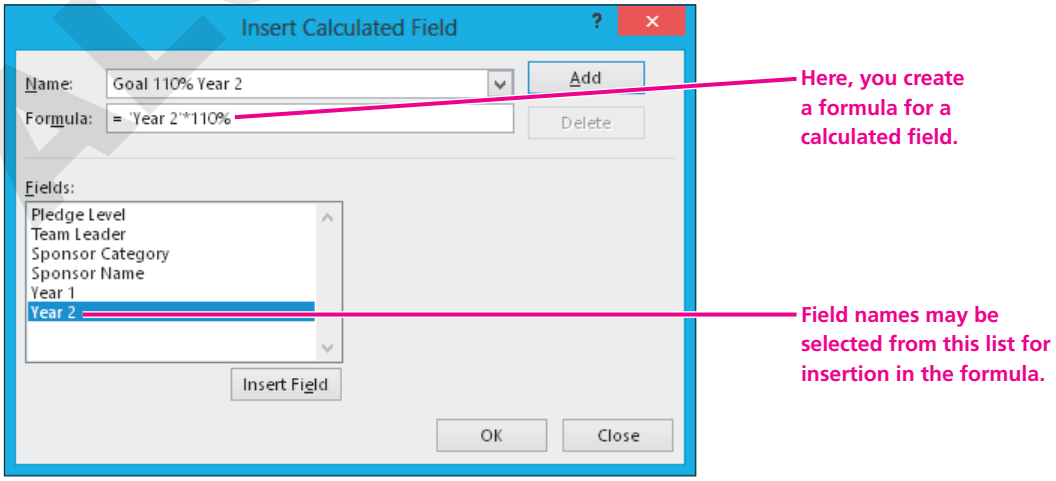
By default, the subtotals and grand totals in a PivotTable sum the values in a field. You may change the SUM function to a different function, such as AVERAGE, MAX, or COUNT.

If the Values area of the PivotTable Fields task pane contains only one entry, all SUM columns will change to the function you selected. If multiple entries exist in the Values area, you may change the function for one entry at a time.

Creating a Calculated Field

Some functions are not available on the Summarize Values By tab of the Value Field Settings dialog box. These functions may be typed in the Insert Calculated Field dialog box. A calculated field contains a formula using values from one or more existing fields. For example, the formula could subtract the value in one field from another to find the difference.

For accuracy, you should select field names from the list rather than type their names when creating the formula for a calculated field.



Converting Column Data to a Calculation

The Show Values As tab of the Value Field Settings dialog box can be used to create formulas employing preset options. For example, you can calculate percentages of a total, the difference between values in two columns, a running total, or a ranked order. If you want to display the original column data along with the converted data, simply drag and drop the field name from the field list to the Values area to create a duplicate field.

Refreshing PivotTable Data

FROM THE RIBBON

PivotTable Tools→Analyze→Data→Refresh ▼→Refresh *or* Refresh All

FROM THE KEYBOARD

Ctrl+Alt+F5 to refresh all data sources

PivotTables are often created with data from sources external to the Excel workbook containing the PivotTables. After you change the source data—even if in a worksheet range or table within the same workbook—you must refresh the PivotTables manually. You may refresh just the active PivotTable or all PivotTables in the workbook. You may also set a PivotTable option to refresh data from external sources when the workbook is opened.

QUICK REFERENCE **EDITING PIVOTTABLE CALCULATIONS AND REFRESHING DATA**

Task	Procedure
Change the summary function	■ Select a number cell in any PivotTable column that contains the existing calculation. ■ Choose PivotTable Tools→Analyze→Active Field→Field Settings, choose a different function, and click OK.
Create a calculated field to the right of existing PivotTable columns	■ Select any PivotTable cell. ■ Choose PivotTable Tools→Analyze→Calculations→Fields, Items, & Sets→ Calculated Field and type a name in the Name box. ■ Edit the formula =0 by double-clicking field names and typing other parts of the formula, click Add, and click OK.
Modify a formula in a calculated field	■ Choose PivotTable Tools→Analyze→Calculations→Fields, Items, & Sets→ Calculated Field. ■ Choose the calculated field name in the Name drop-down list (not the Field list), edit the formula, and click OK.
Delete a calculated field	■ Choose PivotTable Tools→Analyze→Calculations→Fields, Items, & Sets→ Calculated Field. ■ Choose the calculated field name in the Name drop-down list (not the Field list), click Delete, and click OK.
Convert all data in a field to percentages or calculate a difference, running total, or ranked order	■ If a duplicate field is desired to retain the original column data, drag and drop the field name into the Values area. ■ Right-click a number cell in the desired column of the PivotTable and choose Show Values As. ■ Choose the desired preset option, and if necessary, select the desired options; click OK.
Refresh PivotTables after changing source data	■ Choose PivotTable Tools→Analyze→Data→Refresh menu ▼ and choose Refresh or Refresh All.

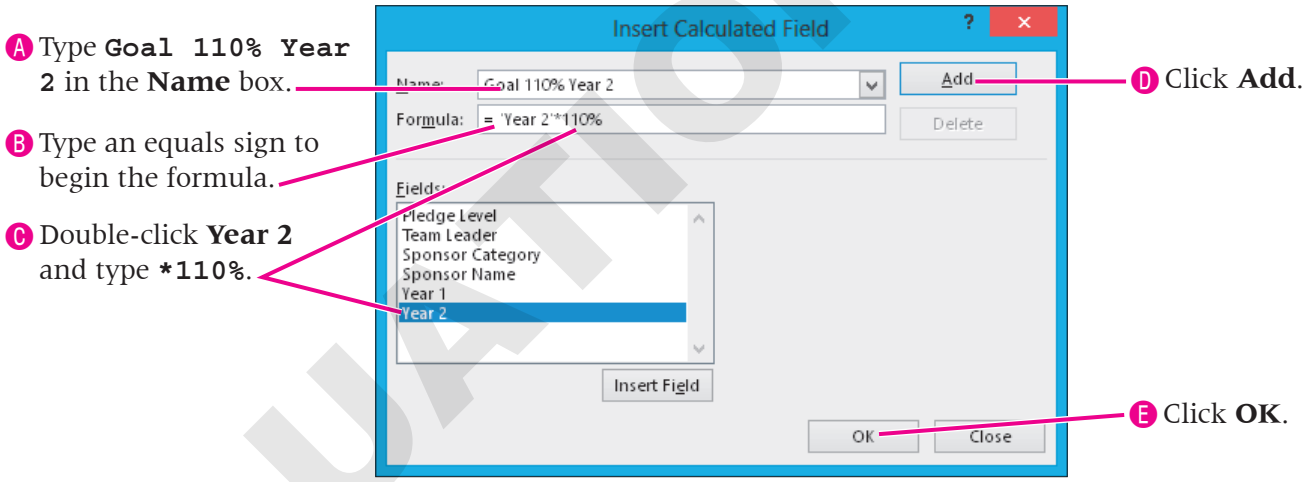
DEVELOP YOUR SKILLS EX12-D06

Change PivotTable Calculations

In this exercise, you will change the default SUM to a different function. You will also create a calculated field and change a value in the original source table.

1. Save your file as **`EX12-D06-Sponsors-[FirstInitialLastName]`**.
2. Display the **PivotTable by Pledge Level** worksheet.
3. Select a number cell in **column B** of the PivotTable, and then choose **PivotTable Tools→Analyze→Active Field→Field Settings**.
4. Select **Average** on the **Summarize Values By** tab and click **OK**.

   The column heading changes to Average of Year 1 in the PivotTable and the Values area of the task pane. The subtotals and grand total now calculate averages. The Sum of Year 2 column did not change.
5. Choose **PivotTable Tools→Analyze→Calculations→Fields, Items, & Sets→Calculated Field**.
6. Follow these steps to create a calculated field:



The calculated field displays as the last column of the PivotTable.

	A	B	C	D
3	Row Labels	Average of Year 1	Sum of Year 2	Sum of Goal 110% Year 2
4	Level 1	13,029,720	118,272,625	130,099,888
5	Faber	5,820,000	20,300,000	22,330,000
6	Lemus	17,461,496	82,972,625	91,269,888
7	Weinstein	12,500,000	15,000,000	16,500,000

Change Worksheet Data

Now you will change a value in the table upon which the PivotTable is based.

7. Display the **Sponsors Table** worksheet.
8. In **cell F98** change 250,000 to **200000**, and then display the **PivotTable by Pledge Level** worksheet.

   Faber's level 2 amount in Year 2 still appears as 250,000 in cell C10. Changes to the source data do not automatically update in the PivotTables.
9. Choose **PivotTable Tools→Analyze→Data→Refresh menu ▼→Refresh All**.

   Faber's amount now appears as 200,000, and the goal was recalculated in cell D10. Any other PivotTables or PivotCharts based on the same source data would also be updated.
10. Save the file and leave it open.

Creating PivotCharts

Video Library http://labyrinthelab.com/videos Video Number: EX13-V1207

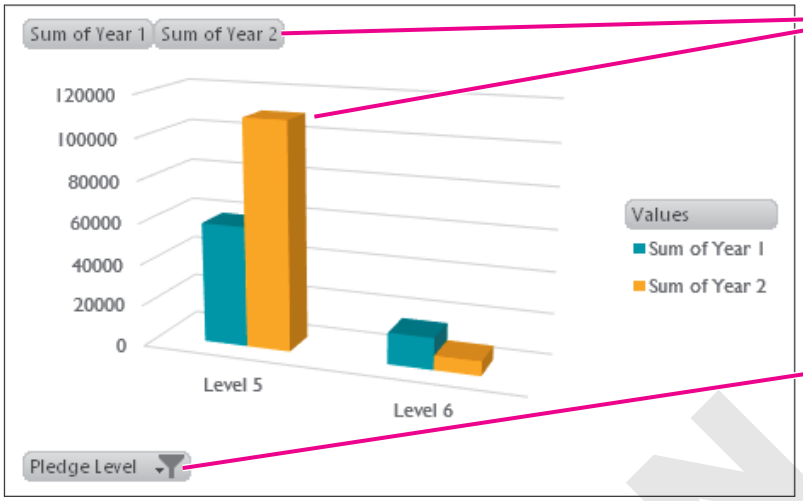
A PivotChart presents data from a PivotTable. There are two ways to create a PivotChart.

1. Chart an existing PivotTable by choosing a chart type from the Insert tab, as you would do for a normal Excel chart.
2. Use the PivotChart command to create a PivotTable and PivotChart from the source data at the same time. The chart builds as you choose fields in the PivotTable Fields task pane.

The fields in the values area of the PivotTable are displayed as data series in the chart. The row labels in the PivotTable are used as the axis labels in the chart; the column labels are the data series in the chart legend.

Filtering PivotCharts

The PivotChart may be filtered using the AutoFilter buttons on the chart, AutoFilter buttons on the PivotTable, or slicers added to the worksheet. The filtering is applied to the related PivotTable as well.



TIP

To retain an original PivotTable, copy it before creating a PivotChart, as any changes to the chart will update the PivotTable copy.

Formatting and Printing PivotCharts

You format PivotCharts using the same Ribbon commands as you do for normal Excel charts. Some chart formatting, such as data labels, is not preserved after a PivotChart is refreshed.

QUICK REFERENCE **WORKING WITH PIVOTCHARTS**

Task	Procedure
Create a PivotChart from an existing PivotTable	■ Select any cell within the PivotTable. ■ Choose Insert→Charts and choose a chart type. The chart is created next to the PivotTable.
Create a PivotTable and PivotChart concurrently from a worksheet range or table	■ Select any cell in the worksheet range/table and choose Insert→Charts→PivotChart menu ▼→PivotChart & PivotTable. ■ Select the desired options and click OK. ■ Choose options for the PivotTable/PivotChart in the PivotTable Fields/PivotChart Fields task pane.
Modify a PivotChart format	■ Select the chart and choose from the PivotChart Tools→Design and/or PivotChart Tools→Format tab commands.
Filter data in a PivotChart	■ Choose the AutoFilter button on the PivotChart for the desired field, choose the desired filtering options, and click OK. Or, choose PivotChart Tools→Analyze→Filter→Insert Slicer, choose the desired slicer(s), and click OK. Then choose the desired filtering criteria from the slicer(s).

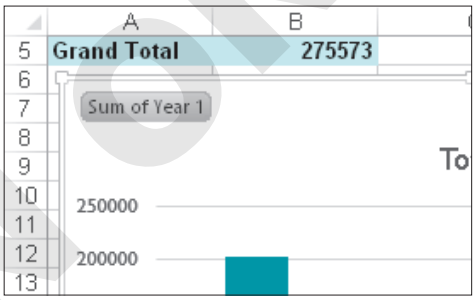
DEVELOP YOUR SKILLS EX12-D07

Create a PivotChart

In this exercise, you will create a PivotChart from an existing PivotTable.

1. Save your file as **EX12-D07-Sponsors-[FirstInitialLastName]**.
2. Display the **PivotChart** worksheet.
3. Select any cell within the PivotTable, and then choose **Insert→Charts→Insert Column Chart→2-D Column→Clustered Column**.
4. Point at the chart frame and drag the chart just below the PivotTable.
5. Place a checkmark next to **Year 2** in the PivotChart Fields list.

   The Sum of Year 2 column displays in the PivotTable, and the PivotChart displays an additional column for the Sum of Year 2 series.



6. To filter the PivotChart, choose the **Pledge Level AutoFilter** button at the lower-left corner of the PivotChart, remove the checkmark next to **Level 4**, and click **OK**.
7. Select the chart, choose **PivotChart Tools→Design→Type→Change Chart Type→Column→3-D Clustered Column**, and click **OK**.

   The chart is reconfigured to the new chart type.
8. Save and close the file.

Changing Macro Security

Video Library http://labyrinthelab.com/videos Video Number: EX13-V1208

A macro is a recorded set of mouse and keyboard actions that can be played back at any time. Macros are useful for automating routine tasks, especially if those tasks are lengthy. Macros can contain viruses, so be cautious about opening workbooks containing macros that you receive from others.

Security Levels

You change macro security in the Trust Center section within Excel Options. Your setting there is in effect for all Excel workbooks that you open on your computer. The setting is not embedded in any workbooks that you save and share with others. You may choose among four different levels of security in Excel that control whether macros in an opened workbook are available or disabled.

FROM THE RIBBON
File→Options→Trust Center→Trust Center Settings→Macro Settings

- **Enable all macros:** You are not protected from potentially unsafe macros. This option is not recommended for general use.
- **Disable all macros except digitally signed macros:** This option automatically disables unsigned macros and enables macros from publishers previously added to the trusted publishers list in the Trust Center.
- **Disable all macros with notification:** This is the default option that displays a message allowing you to enable macros in the specified workbook or use the workbook without enabling macros.
- **Disable all macros without notification:** Only macros in workbooks that you placed in a trusted location of the Trust Center will run. All other digitally signed and unsigned macros are disabled.

If you have antivirus software installed, the file will be scanned for viruses before it is opened regardless of the security level set. Also, note that your network system administrator may set macro security and prevent users from changing it.

DEVELOP YOUR SKILLS EX12-D08

Verify Macro Security

In this exercise, you will verify the macro security setting on your computer. Then you will open a workbook and enable its macros.

1. Choose **File→Options→Trust Center**.
2. Click the **Trust Center Settings** button, choose the **Macro Settings** category, and choose **Disable All Macros with Notification** (if necessary).
3. Choose the **Message Bar** category from the left side of the window. Verify that the **Show the Message Bar…** option is selected.
4. Click **OK** twice to close both dialog boxes.
5. Open **EX12-D08-MacroTest** from the **EX2013 Lesson 12** folder.
6. Click **Enable Editing** below the Ribbon if necessary. Save the file as **`EX12-D08-MacroTest-[FirstInitialLastName]`**.
   A Security Warning message may display below the Ribbon to alert you that macros are disabled.
7. Click the **Enable Content** button , if necessary.
   The macros are enabled.
8. Click the **Sort by Leader** button.
   The worksheet list should sort in order by team leader, indicating that the macro worked successfully.
9. Close the file without saving changes.

Recording Macros

Video Library http://labyrinthelab.com/videos Video Number: EX13-V1209

Excel's macro recording feature is similar to a video camera. You turn it on, press a button to start recording, and press a button to stop recording when finished. You may replay the recording as many times as you want, during which macros play back recorded keystrokes and mouse actions.

After the Record Macro button is clicked in the Status Bar, the Stop Recording button appears.

Naming a Macro

You can name your macros, or use Excel's default names (Macro1, Macro2, etc.). Macro names may not contain spaces but may include capital letters and underscores.

Recording Macro Steps

Most actions you perform are recorded in a macro. These include mouse actions, choosing Ribbon commands, selecting options in dialog boxes, using arrow keys to navigate the worksheet, and typing text. Any mistakes and corrections you make during recording are also saved in the macro. If the final result is correct, you can choose to include mistakes and corrections and not bother to rerecord the macro, as there would be no benefit to doing so.

Practice the procedure you wish to automate before recording the macro. This will help you avoid mistakes during the recording process.

Storing Macros

Macros are available only in the workbook in which you create them unless you assign them to the Personal Macro Workbook. Some macros are useful only in a particular workbook. For these macros, you would choose the This Workbook storage option. Other macros can benefit multiple workbooks. So that they will be available for all workbooks, these macros are assigned to a Personal Macro Workbook, which is a hidden file used to make macros available to all open workbooks.

Saving a Workbook Containing Macros

If you attempt to save a workbook containing macros using the normal Excel Workbook file format, Excel displays the message "The following features cannot be saved in macro-free workbooks: VB Project." Clicking No in the message box displays the Save As dialog box, where you should choose the Excel Macro-Enabled Workbook file format. The file is saved with the extension .xlsm to indicate that it contains a macro.

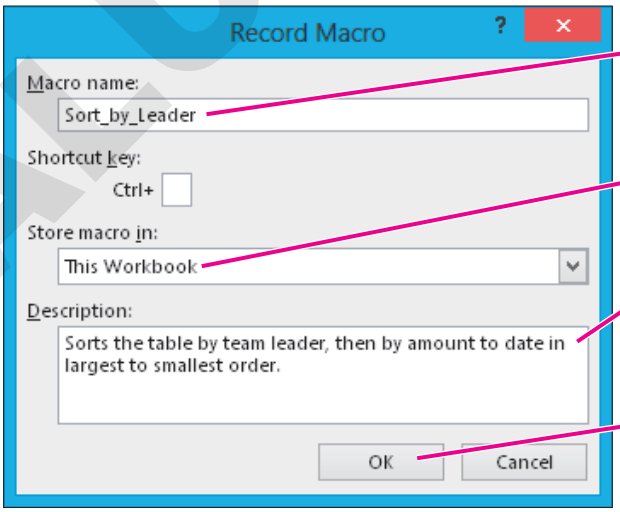
QUICK REFERENCE	RECORDING A MACRO
Task	**Procedure**
Record a macro	■ Create the worksheet and prepare to record the macro. ■ Click Record Macro on the Status Bar or right-click the Status Bar and choose Macro Recording (tap Esc to hide the context menu). ■ Type a descriptive name in the Macro Name box, fill in other options as desired, and click OK to begin recording. ■ Execute the commands and actions you want the macro to record. ■ Click Stop Recording when finished.
Delete a macro	■ Choose View→Macros→View Macros, choose the desired macro name, and click Delete.
Save a workbook containing macros	■ Choose Save and select No in the message box; or, choose File→Save As, choose Computer→Browse, and navigate to the desired location. ■ Choose Excel Macro-Enabled Workbook from the Save as Type list and click Save.

DEVELOP YOUR SKILLS EX12-D09

Record a Macro

In this exercise, you will record a macro to sort a table first by team leader and then by the contributions to date. You will save the workbook in the macro-enabled file format.

1. Open **EX12-D09-Contributions** from the **EX2013 Lesson 12** folder and save it as **`EX12-D09-Contributions-[FirstInitialLastName]`**.
2. Click the **Record Macro** button on the Status Bar at the bottom-left corner of the window.
   If the button does not display, right-click the Status Bar and choose Macro Recording. Tap Esc to hide the context menu.
3. Follow these steps to name the macro and begin the recording process:



A Type **`Sort_by_Leader`** to name the macro.

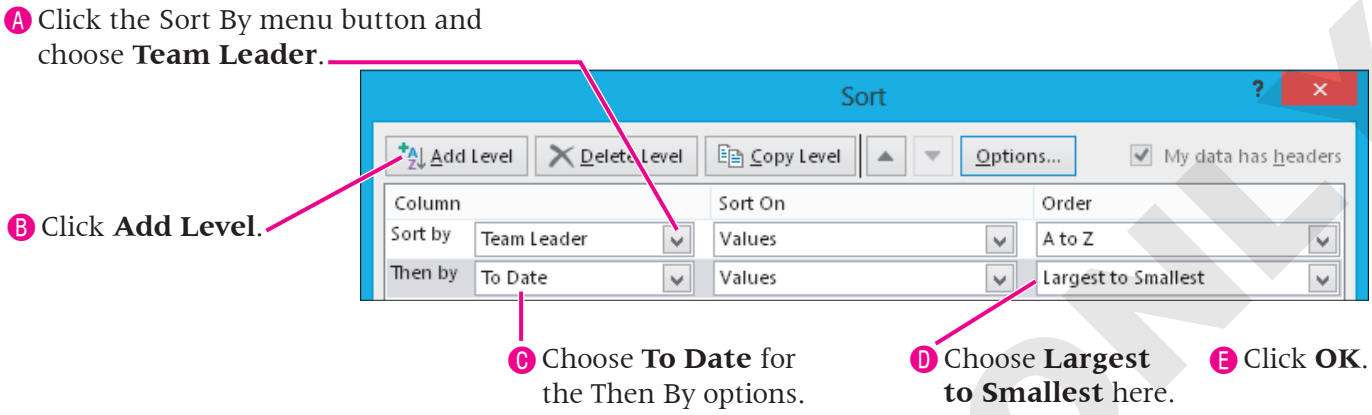
B Verify that **This Workbook** displays here.

C Type this description.

D Click **OK**.

If you make mistakes as you are recording the macro steps, just correct the errors as you would normally.

4. Select **cell B4** in the table, and then choose **Data→Sort & Filter→Sort**.
5. Follow these steps to set the sort parameters and initiate the sort:



6. Click **Stop Recording** on the Status Bar.
   Your actions have now been saved in the macro.
7. Click **Save**. Click **No** in the dialog box, and then choose **Computer→Browse** if necessary.
8. Edit the filename to **`EX12-D09-ContsWithMacros-[FirstInitialLastName]`**, choose **Excel Macro-Enabled Workbook** from the Save as Type list, and click **Save**. Keep the file open.
   The macro is saved as part of the workbook named ContsWithMacros.xlsm. If you were to close the workbook, the macro would be available the next time you opened it.

Running Macros

Video Library http://labyrinthelab.com/videos Video Number: EX13-V1210

FROM THE RIBBON
View→Macros→View Macros

FROM THE KEYBOARD
Alt+F8 to view macros

You may run a macro from within the Macro dialog box. However, macros are more accessible if you assign them to shortcut keys, custom buttons or graphics on a worksheet, or buttons on the Quick Access toolbar. You then run a macro by issuing the shortcut key or clicking the object to which it is assigned.

DEVELOP YOUR SKILLS EX12-D10

Run an Unassigned Macro

In this exercise, you will sort the contributions table manually in a different order and then run a macro.

1. Save your file as **`EX12-D10-ContsWithMacros-[FirstInitialLastName]`**.
   If you reopened the Contributions with Macros workbook and the Security Warning appears, choose Enable Macros.
2. Select **cell D4** and choose **Data→Sort & Filter→Sort A to Z**.
   The contributions table is sorted alphabetically by sponsor name. Now you will run the macro you created in the previous exercise.

3. Choose **View→Macros→View Macros**, choose the **Sort_by_Leader** macro, and click **Run**.

   The macro has saved you time by sorting the list by team leader, then by the To Date amount in highest to lowest order within each team leader's row.

4. Save the file and leave it open.

Assigning Macros

Video Library http://labyrinthelab.com/videos Video Number: EX13-V1211

Macros can be assigned to shortcut keys, or to either custom buttons or graphics within a worksheet.

Assigning Macros to Shortcut Keys

Excel lets you assign a macro to a shortcut key as you name the macro. You must use Ctrl or Ctrl+Shift as part of the shortcut key combination. Any shortcut you assign will override an existing Excel command shortcut. For example, if you assign Ctrl+B to a macro, that combination would no longer apply bold formatting.

TIP

If you are in the habit of using Microsoft's command shortcuts, avoid overriding them by using Ctrl+Shift for your macro shortcuts.

DEVELOP YOUR SKILLS EX12-D11

Assign a Macro to a Shortcut Key

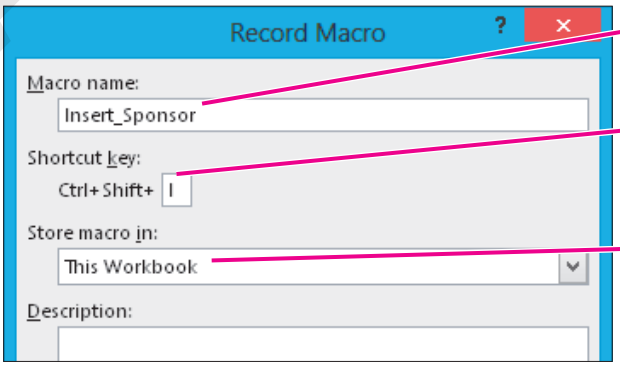
In this exercise, you will create a macro, assign multiple macros to different shortcut keys, and run macros.

1. Save your file as **`EX12-D11-ContsWithMacros-[FirstInitialLastName]`**.

   If you reopened the Contributions with Macros workbook and the Security Warning appears, choose Enable Macros.

2. Click **Record Macro** on the Status Bar.

3. Follow these steps to name a new macro:



A. Type **`Insert_Sponsor`** in the **Macro Name** box.

B. Hold down Shift and tap I to set the shortcut as Ctrl+Shift+I.

C. Verify that the macro will be stored in **This Workbook**.

D. Click **OK**.

Now you will perform the actions to be recorded in the macro. You will insert a blank table row below the column headings and copy cell formatting to the blank cells.

4. Select **cell A4**, and then choose **Home→Cells→Insert**.
   A blank row is inserted at row 4, and its cells are formatted like the column headings.
5. Select the **range A5:G5**, choose **Home→Clipboard→Format Painter**, and select **cell A4** to apply the cell formatting from row 5 to the blank row 4.
6. Select **cell A4** again to position the pointer for data entry.
7. Click **Stop Recording**.
8. Delete the blank **row 4** that you inserted while creating the macro, then use Ctrl+Shift+I to run the Insert_Sponsor macro.
   The pointer moves to cell A4 and blank cells are inserted. New sponsors always will be added to a new row below the header row.
9. Add this sponsor to the table. Tap Tab after entering the Year 2 value to have the To Date value calculate automatically.

3	Pledge	Team Leader	Sponsor Category	Sponsor Name	Year 1	Year 2	To Date
4	Level 6	Weinstein	Individual Contribution	Raul T. Garcia	0	500	500

10. Run the **Insert_Sponsor** macro again and add this sponsor to the table.

3	Pledge	Team Leader	Sponsor Category	Sponsor Name	Year 1	Year 2	To Date
4	Level 6	Weinstein	Individual Contribution	Wayne Zobe	0	300	300

Assign a Shortcut Key to the Sort_by_Leader Macro

11. Choose **View→Macros→View Macros**.
12. Choose the **Sort_by_Leader** macro, and then click **Options**.
13. In the Shortcut Key text box, press Shift, and tap L to set the shortcut key to Ctrl+Shift+L; click **OK**.
14. Click **Cancel** to exit the Macro dialog box, then use Ctrl+Shift+L to run the macro.
    The table is sorted by team leader and then by the To Date amount in highest to lowest order within each team leader group. The Raul T. Garcia record moves to row 98 in the Weinstein team leader group. The Wayne Zobe record moves to row 101.
15. Save the file and leave it open.

Assigning Macros to Custom Buttons

Video Library http://labyrinthelab.com/videos Video Number: EX13-V1212

A macro assigned to a custom button is run whenever the button is clicked. The easiest way to create a custom button is to add a shape to the worksheet. You then assign a macro to the button. A custom button may also contain a descriptive label to help identify its function or the macro that is assigned to it.

You create custom buttons using the Insert Controls tool on the Developer tab. To display this tab, choose File→Options, click Customize Ribbon, place a checkmark next to Developer in the Main Tabs list at the right, and click OK.

QUICK REFERENCE **ASSIGNING A MACRO**

Task	Procedure
Assign a macro to a shortcut key as the macro is created	■ Click Record Macro. ■ While filling in options in the Macro dialog box, click in the Shortcut Key text box and type a single letter (or hold Shift and type the letter).
Assign a macro to a shortcut key after the macro is created	■ Choose View→Macros→View Macros, choose the macro name, and click Options. ■ In the Macro Options dialog box, click in the Shortcut Key text box and type a single letter (or hold Shift and type the letter).
Assign a macro to a button or object on the worksheet	■ Record the macro. ■ Insert a shape, picture, or clip art image on the worksheet and right-click the object, or insert a button. ■ Choose Assign Macro, choose the desired macro, and click OK. ■ To display a text label in a button, select the button in the worksheet and type the desired text. ■ If necessary, resize the button or graphic, drag it to the desired worksheet location, and align multiple buttons.

DEVELOP YOUR SKILLS EX12-D12

Assign Macros to Shapes

In this exercise, you will create rectangles and assign the Insert_Sponsor and Sort_by_Leader macros to them.

1. Save your file as **`EX12-D12-ContsWithMacros-[FirstInitialLastName]`**.
   If you reopened the Contributions with Macros workbook and the Security Warning appears, choose Enable Macros.
2. Choose **Insert→Illustrations→Shapes→Rectangles→Rectangle**.

3. Drag the mouse to draw a rectangle on **cell D1**. Copy and paste the button to **cell E1**.

4. Select the first rectangle and type **`Insert Sponsor`** (don't tap Enter), select the second rectangle, and type **`Sort by Leader`**.

Shape text may contain spaces.

5. Click outside the rectangle to deselect it. Then, use Shift to select both rectangles and choose **Drawing Tools→Format→Arrange→Align Objects→Align Middle**.

Formatting the rectangles is easier if completed before you assign macros to them.

Assign Macros to Shapes

6. Deselect the two rectangles.

7. Right-click the **Insert Sponsor** rectangle, choose **Assign Macro**, choose **Insert_Sponsor**, and click **OK**.

8. Assign the **Sort_by_Leader** macro to its rectangle.

9. Deselect the rectangle.

10. Click the **Insert Sponsor** rectangle to run the Insert_Sponsor macro.

A new row appears just below the header row.

11. Add this sponsor to the new row:

3	Pledge	Team Leader	Sponsor Category	Sponsor Name	Year 1	Year 2	To Date
4	Level 3	Abbott	Organization Contribution	Kelsey Foundation	0	50,000	50,000

12. Click the **Sort by Leader** rectangle to run the Sort_by_Leader macro.

The new row is sorted into the worksheet as row 5.

13. Save and then close the file. Exit **Excel**.

Concepts Review

To check your knowledge of the key concepts introduced in this lesson, complete the Concepts Review quiz by choosing the appropriate access option below.

If you are…	Then access the quiz by…
Using the Labyrinth Video Library	Going to http://labyrinthelab.com/videos
Using eLab	Logging in, choosing Content, and navigating to the Concepts Review quiz for this lesson
Not using the Labyrinth Video Library or eLab	Going to the student resource center for this book

Reinforce Your Skills

REINFORCE YOUR SKILLS EX12-R01

Analyze Data

In this exercise, you will use an HLOOKUP function to enter data within a car donation worksheet. You will then create a PivotTable and PivotChart to analyze the data.

Use LOOKUP Functions

1. Start **Excel**. Open **EX12-R01-CarDonations** from the **EX2013 Lesson 12** folder and save it as **`EX12-R01-CarDonations-[FirstInitialLastName]`**.
2. Select **cell F5** and click **Insert Function** fx.
3. Choose **All** from the Or Select a Category list.
4. Tap H to jump to the functions beginning with the letter *H* in the Select a Function list.
5. Continue tapping H until HLOOKUP is highlighted, and then tap Enter.
6. Select **cell E5** as the Lookup_Value. Select the **range J5:L7** as the Table_Array and apply absolute formatting to this range. Type **2** as the Row_Index_Num and click **OK**.
   The HLOOKUP function returns 1, which is the rounded result of the 90 percent Realized Value in the third column of the table array. This result must be multiplied by the value displayed in column E to complete the Realized Value formula.
7. Ensure that **cell F5** is selected, click in the Formula Bar at the end of the current formula, type **`*E5`**, and confirm the formula.
   The formula now returns a result of 41,301, which is 90 percent of the value in column E. The remaining cells in column F of the table have automatically populated.
8. In **cell G5** type this formula: **`=HLOOKUP(E5,$J$5:$L$7,3)`**
   The result Individual Resale (which is listed in the third column of the table array) is returned in cell G5, and the remaining cells in column G of the table have automatically populated.

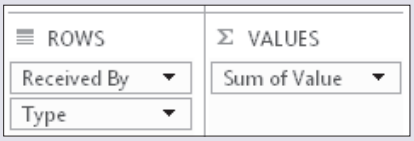
Create PivotTables and PivotCharts

9. Select **cell A4**.
   This ensures that Excel will use the table data when you create the PivotTable.
10. Choose **Insert→Charts→PivotChart**, verify **JanSales** as the Table/Range, and click **OK**.
11. Rename the Sheet1 sheet tab as **`PivotTable`**.
    The PivotChart Fields task pane displays. If it does not and you made certain that the chart is selected, choose Analyze→Show/Hide→Field List.
12. In the PivotChart Fields task pane, place a checkmark in the **Received By** and **Value** checkboxes.
    The PivotTable displays the total donations generated by each representative using the Sum of Value field in the Values area of the PivotChart Fields task pane. The chart is selected, so the task pane displays Axis (Categories) and Legend (Series) field areas.

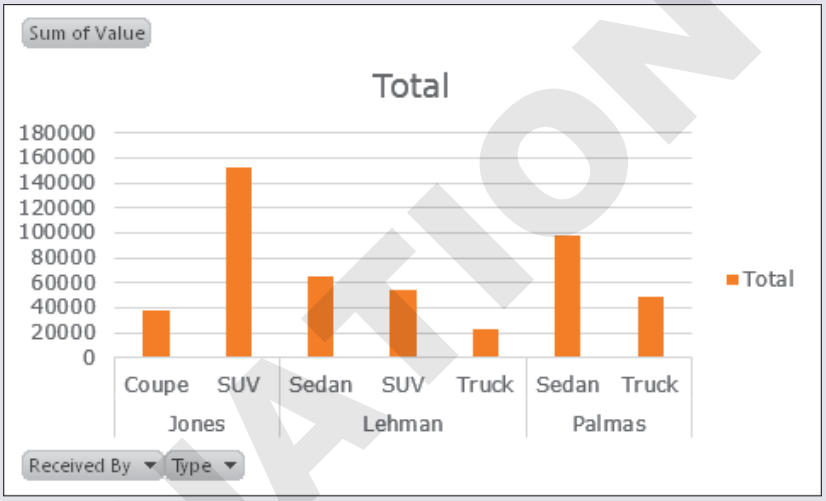
13. Select a cell in the PivotTable, and the areas referenced above are now titled Rows and Columns to reflect those items in the PivotTable.

Since you may need to know which types of cars each representative received during January, you will place a new field in the Rows area.

14. Place a checkmark in the **Type** box on the task pane to add the field to the Rows area.



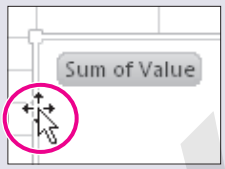
	A	B
1	Row Labels	Sum of Value
2	Jones	190470
3	Coupe	37950
4	SUV	152520
5	Lehman	142620
6	Sedan	65445
7	SUV	54675
8	Truck	22500
9	Palmas	146675
10	Sedan	98425
11	Truck	48250
12	Grand Total	479765



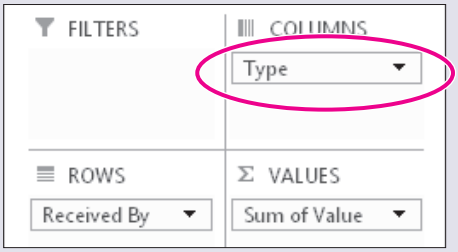
The PivotTable and PivotChart expand to display the vehicles received by each representative. It might also be interesting to summarize how the donations break down by vehicle type, so in the next step you will pivot the Type field from the row area to the column area. You may not see the entire PivotTable and PivotChart as items change in the window.

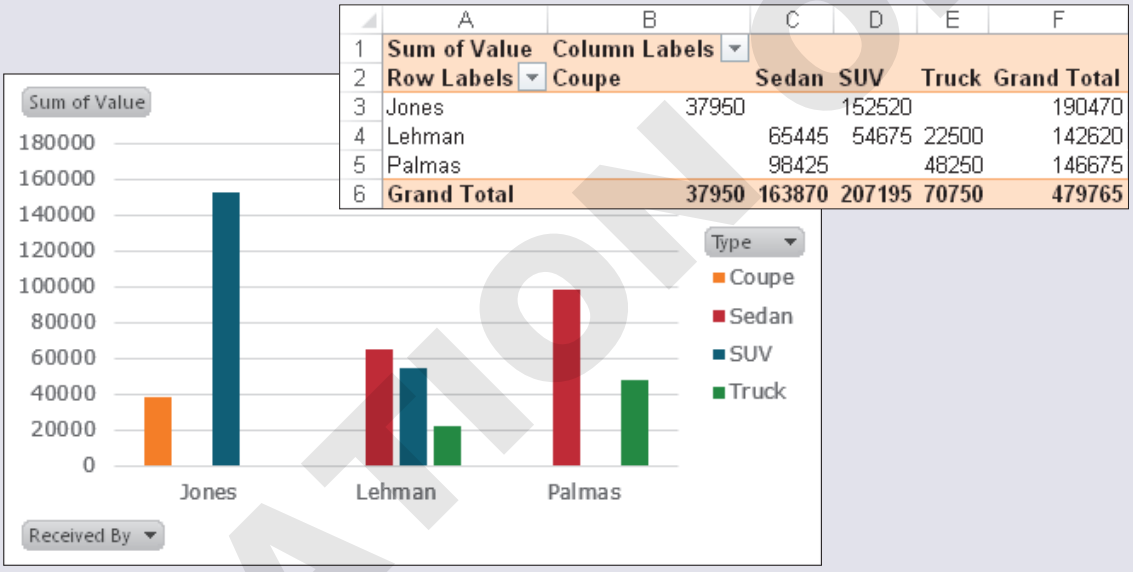
15. To maximize space, unlock the task pane by dragging its title bar down and to the left. Resize the PivotTable Field List by dragging its bottom border up or down to keep desired options visible.

16. To prevent the PivotChart from covering the PivotTable in the next step, move the PivotChart by dragging the chart frame until the left edge of the chart is in column G.



17. Select a cell in the PivotTable. In the PivotTable Fields task pane, drag the **Type** field to the **Columns** area.



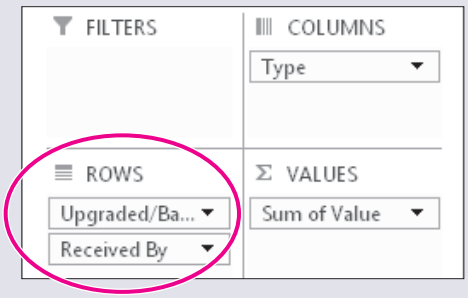


	A	B	C	D	E	F
1	**Sum of Value**	**Column Labels**				
2	**Row Labels**	**Coupe**	**Sedan**	**SUV**	**Truck**	**Grand Total**
3	Jones	37950		152520		190470
4	Lehman		65445	54675	22500	142620
5	Palmas		98425		48250	146675
6	**Grand Total**	**37950**	**163870**	**207195**	**70750**	**479765**

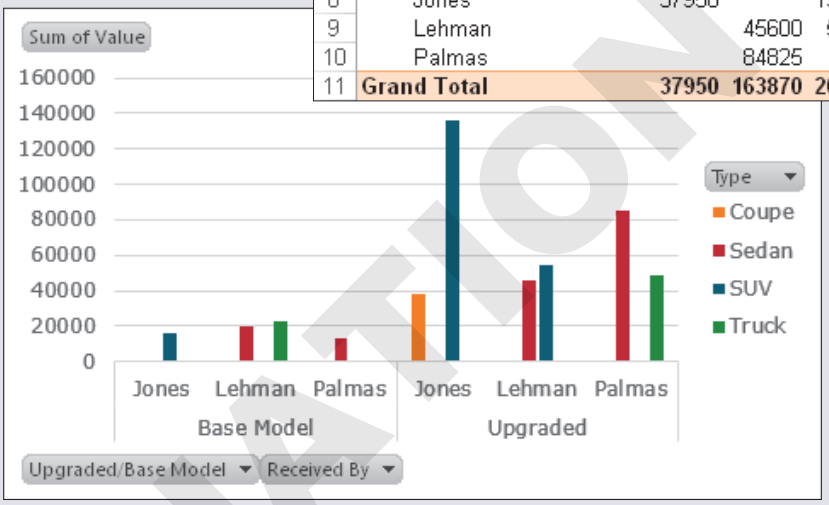
The Grand Total line at the bottom of the PivotTable displays the donations from each type of car. The chart displays columns for each car type.

18. Place a checkmark in the **Upgraded/Base Model** box on the task pane to add the field to the Rows area. Observe the effect in the PivotTable and the PivotChart.

19. Drag the **Upgraded/Base Model** field above Received By in the Rows area of the task pane.



	A	B	C	D	E	F
1	Sum of Value	Column Labels				
2	Row Labels	Coupe	Sedan	SUV	Truck	Grand Total
3	Base Model		33445	16400	22500	72345
4	Jones			16400		16400
5	Lehman		19845		22500	42345
6	Palmas		13600			13600
7	Upgraded	37950	130425	190795	48250	407420
8	Jones	37950		136120		174070
9	Lehman		45600	54675		100275
10	Palmas		84825		48250	133075
11	Grand Total	37950	163870	207195	70750	479765



This view shows that donations are much greater for upgraded cars than base models.

20. Move the PivotChart below the PivotTable so both fit on one printed page.

21. Drag the PivotChart Fields task pane beyond the right edge of the screen so it locks in place (is docked).

22. Select a cell in the PivotTable to deselect the PivotChart.
Only the chart will print when the chart is selected.

23. Save and close the file; exit **Excel**.

24. Submit your final file based on the guidelines provided by your instructor.
To view examples of how your final file or files should look at the end of this exercise, go to the student resource center.

REINFORCE YOUR SKILLS EX12-R02

Create and Run a Macro

In this exercise, you will create a macro that selects an entire worksheet, formats all cells with bold, and widens the columns. You will assign the macro to shortcut keys and run it.

Change Macro Security

1. Start **Excel** and open a new workbook.

   Now you will change the security settings. These may already be set by your network system administrator, and may be locked. If you are unable to change the settings, skip the following two steps.

2. Choose **File→Options→Trust Center** and click the **Trust Center Settings** button. If necessary, choose **Macro Settings** and **Disable All Macros with Notification**.

3. Choose the **Message Bar** category on the left. Verify that the **Show the Message Bar…** option is selected, and then click **OK** twice.

Record a Macro

4. Click **Record Macro** on the Status Bar.

5. Type the macro name **`FormatSheet`** in the Record Macro dialog box. Set the Store Macro In option to **Personal Macro Workbook**.

   Choose This Workbook if you cannot save a macro to the Personal Macro Workbook on your computer system.

6. Click **OK** (and replace the macro if it already exists) to begin the recording process.

7. Press Ctrl + A to select the entire worksheet and then press Ctrl + B to bold all cells.

8. Choose **Home→Cells→Format →Column Width**.

9. Type **`12`** and tap Enter.

10. Select **cell A1** to deselect the highlighted cells, and then click **Stop Recording** on the Status Bar.

11. Choose **File→Close**. Choose not to save when prompted.

Run Macros

12. Open a new workbook and save it in the **EX2013 Lesson 12** folder as **`EX12-R02-PersonalMacro-[FirstInitialLastName]`**.

13. Choose **View→Macros→View Macros** (the top part of the button) to display the Macro dialog box.

    Any macro with PERSONAL.XLSB! in its name has been saved to the Personal Macro Workbook and is available to all open workbooks.

14. Choose the **PERSONAL.XLSB!FormatSheet** macro and click **Run**.

    Choose FormatSheet if you saved the macro to This Worksheet. The column and text formats are set.

15. Type **`Macro`** in **cell A1**.

    Because the macro was run, this text appears in bold.

Assign Macros

16. Choose **View→Macros→View Macros**  .
17. Click the **PERSONAL→XLSB!FormatSheet** macro from the list box and click **Options**.
18. Click in the Shortcut Key box, hold down Shift and tap F to set the shortcut as Ctrl + Shift + F.
19. Click **OK** and then **Cancel**.
20. Save as a macro-enabled workbook and then close the workbook; do not save changes to the Personal Macro Workbook. Exit **Excel**.
21. Submit your final file based on the guidelines provided by your instructor.

    To see examples of how your file or files should look at the end of this exercise, go to the student resource center.

REINFORCE YOUR SKILLS EX12-R03

Analyze and Automate an Event Donation Listing

In this exercise, you will use a VLOOKUP function to enter data and complete a PivotTable and PivotChart to analyze the data. You will also use a macro to automate tasks.

Use LOOKUP Functions

1. Start **Excel**. Open **EX12-R03-EventDonations** from the **EX2013 Lesson 12** folder and save it as a macro-enabled workbook named **`EX12-R03-EventDonations-[FirstInitialLastName]`**.
2. In the **February Donations** worksheet, select **cell G5** and type this text: **`=VLOOKUP(E5-F5,`**
3. Highlight the table array in the **range I5:J7**.

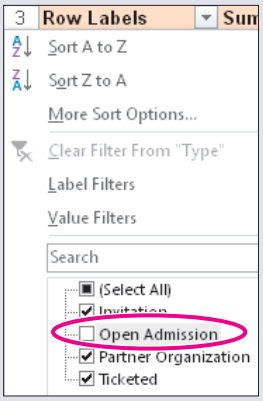
   The table array has already been named Table_Array, so this name appears in the formula when you highlight its range.
4. Type the following to complete the formula: **`,2)`**

   The VLOOKUP function displays Excellent Return, and the remaining cells in column G of the table have automatically populated.

Create PivotTables and PivotCharts

5. Select the **PivotTable** worksheet. Then select a cell within the PivotTable to display the PivotTable Fields task pane, if necessary.

6. Click the **Row Labels AutoFilter** button in **cell A3**, remove the checkmark from the **Open Admission** box, and click **OK**.



Notice that no data is displayed for Open Admission events, and the Row Headers filter button displays a filter icon.

7. Display the **Row Labels** filter list again and choose **Clear Filter from "Type"**.

8. In the PivotTable Fields task pane, remove the checkmark from the **Type** box.

9. Place a checkmark in the **Location** box to add the field to the PivotTable.
The pie chart displays Outdoor as 205195, Online as 108700, and On-site as 154310 for all event donations. Next, you will use slicers to filter a field that is not displayed.

10. Choose **Insert→Filters→Slicer**. In the Insert Slicers dialog box, place a checkmark next to **Event Manager** and click **OK**.
The Event Manager slicer displays on the worksheet window.

11. Point to the **Event Manager** title in the slicer and drag the slicer frame so it is not covering the PivotTable or PivotChart.

12. Choose **Lehman** in the slicer.
The Sum of Donations column in the PivotTable and the PivotChart totals have changed to include only donations attributed to Lehman.

13. Choose **Jones** in the slicer.
The totals update to include only donations attributed to Jones. Note that Jones did not have any on-site donations; therefore, this location type is not displayed in the PivotTable or PivotChart.

14. Select the PivotChart and choose **PivotChart Tools→Design→Chart Styles→More**.

15. Choose a chart style that displays good contrast between the colors of the text and pie slices.

16. Move the PivotChart below the PivotTable so they will fit on one printed page.

Change Macro Security

Now you will change the security settings. These may already be set by your network system administrator, and may be locked. If you are unable to change the settings, skip the following two steps.

17. Choose **File→Options→Trust Center** and click the **Trust Center Settings** button. If necessary, choose **Macro Settings** and **Disable All Macros with Notification**.
18. Choose the **Message Bar** category on the left. Verify that the **Show the Message Bar…** option is selected, and then click **OK** twice.

Record a Macro

19. Select the **February Donations** worksheet and click **Record Macro** on the Status Bar.
20. Type the macro name **`NewEvent`** in the Record Macro dialog box and set the Store Macro In option to **This Workbook**.
21. Click **OK** (and replace the macro if it already exists) to begin the recording process.
22. Right-click the **row 25** header and choose **Insert**.
23. Select **cell H25** and type **`New`**.
24. Select **cell A1** and click **Stop Recording** on the Status Bar.

Run Macros

25. Choose **View→Macros→View Macros** (the top part of the button) to display the Macro dialog box.
26. Choose the **NewEvent** macro and click **Run**.
    A new row is inserted at the bottom of the list, and the New label is inserted in column H.

Assign Macros

27. Choose **View→Macros→View Macros**.
28. Click the **NewEvent** macro from the list box, and then click **Options**.
29. Click in the Shortcut Key box, hold down Shift and tap N to set the shortcut as Ctrl + Shift + N.
30. Click **OK** and then **Cancel**.
31. Save as a macro-free workbook and then close the file; exit **Excel**.
32. Submit your final file based on the guidelines provided by your instructor.

Apply Your Skills

APPLY YOUR SKILLS EX12-A01

Analyze Data

In this exercise, you will use VLOOKUP to calculate total expenses and to classify each event. You will then create a PivotTable and PivotChart that display the cost of events summarized by media and play mode.

Use LOOKUP Functions

1. Start **Excel**. Open **EX12-A01-MayExpenses** from the **EX2013 Lesson 12** folder and save it as **`EX12-A01-MayExpenses-[FirstInitialLastName]`**.
2. Use the VLOOKUP function in **column H** to determine the total cost for each event. The function should use the subtotal in column G as the lookup value and search the Misc_Costs table for the miscellaneous costs, the value of which should be added to the subtotal in column G to arrive at the total cost.
3. Use the VLOOKUP function in **column I** to determine the classification for each event. The function should use the subtotal in column G as the lookup value and search the Misc_Costs table for the proper classification.
4. AutoFill the formulas in the **range H5:I5** to **row 23**.

Create PivotTables and PivotCharts

5. Create a **PivotTable** on a new worksheet based on the May expense data.
6. Rename the new sheet with a descriptive name of your choice. Rename the PivotTable to **`May Expenses`**.
7. Set up fields for the PivotTable so the table summarizes the data by **Media** and then by **Play Mode**.
8. Set up fields so the event costs and setup costs are calculated separately.
9. Format all numbers in the PivotTable with **Comma Style** and no decimal places.
10. Create a **Stacked Column PivotChart** on the new worksheet.
11. Apply a **PivotChart** style and a chart layout of your choice. If your layout includes titles, replace the placeholders with appropriate titles.
12. Change the page orientation and make any other adjustments to fit the PivotTable and PivotChart on one printed page.
13. Save and close the file; exit **Excel**.
14. Submit your final file based on the guidelines provided by your instructor.

    To see examples of how your file or files should look at the end of this exercise, go to the student resource center.

APPLY YOUR SKILLS EX12-A02

Create a Macro to Insert a Date

In this exercise, you will create a macro that inserts the phrase Today's Date *in cell A1 and the TODAY() function in cell A2. The macro will also format the two cells. You will assign the macro to the current workbook only.*

Change Macro Security and Record Macros

1. Start **Excel**. Create a new macro-enabled workbook named **`EX12-A02-DateMacro-[FirstInitialLastName]`** and saved to the **EX2013 Lesson 12** folder.
2. If necessary, add or subtract worksheets so a total of three are displayed.
   Now you will change the security settings. These may already be set by your network system administrator, and may be locked. If you are unable to change the settings, skip the following two steps.
3. Ensure that **Disable All Macros with Notification** is selected.
4. Ensure that the **Show the Message Bar…** option is selected.
5. On **Sheet1**, select **cell A10**.
6. Begin recording a new macro.
7. Name the macro **`TodaysDate`** and store it in **This Workbook**. Your macro should record all of the actions in **steps 8–13**
8. Select **cell A1** and type **`Today's Date`**.
9. Enter the formula **`=TODAY()`** in **cell A2**.
   This function displays the current date in the cell.
10. Left-align the date in **cell A2**.
11. Format **cells A1:A2** with size 12, bold, and a blue color for text.
12. Set the width of **column A** to **`20`**.
13. Select **cell B1**, and then stop recording.

Run and Assign Macros

14. Display the **Sheet2** worksheet.
15. Run the macro using the **Run** command in the Macro dialog box.
16. Assign the shortcut keystroke Ctrl + Shift + D to the macro.
17. Display the **Sheet3** worksheet.
18. Test the macro by pressing Ctrl + Shift + D.
19. Save and close the file; exit **Excel**.
20. Submit your final file based on the guidelines provided by your instructor.
    To see examples of how your file or files should look at the end of this exercise, go to the student resource center.

APPLY YOUR SKILLS EX12-A03

Analyze Data and Automate Processes

In this exercise, you will analyze event costs using VLOOKUP, PivotTables, and PivotCharts. You will also create and run a macro to allow for the addition of events to the worksheet.

Use LOOKUP Functions

1. Start **Excel**. Open **EX12-A03-AprilExpenses** from the **EX2013 Lesson 12** folder and save it as a macro-enabled workbook named **`EX12-A03-AprilExpenses-[FirstInitialLastName]`**.
2. Use the VLOOKUP function in **column H** to determine the total cost for each event. The function should use the subtotal in column G as the lookup value and search the Misc_Costs table for miscellaneous costs, the value of which should be added to the subtotal in column G to arrive at the total cost.
3. Use the VLOOKUP function in **column I** to determine the classification for each event. The function should use the subtotal in column G as the lookup value and search the Misc_Costs table for the proper classification.

Create PivotTables and PivotCharts

4. Create a **PivotTable** and **PivotChart** on a new worksheet, based on the April expense data.
5. Rename the new sheet with a descriptive name of your choice. Rename the PivotTable as **`April Expenses`**.
6. Set up fields for the PivotTable so the table and chart summarize the data by **Genre** and then by **Play Mode**.
7. Set up fields so the event costs and setup costs are calculated separately.
8. Format all numbers in the PivotTable with **Accounting** format.
9. Change the chart type to **Clustered Bar** and apply a PivotChart style and a chart layout of your choice.
10. Make any adjustments necessary to fit the PivotTable and PivotChart on one printed page.

Change Macro Security and Record Macros

Now you will change the security settings. These may already be set by your network system administrator, and may be locked. If you are unable to change the settings, skip the following two steps.

11. Ensure that **Disable All Macros with Notification** is selected.
12. Ensure that the **Show the Message Bar...** option is selected.
13. On the **April Expense Report** worksheet, select **cell G1**.
14. Begin recording a new macro.
15. Name the macro **`NewField`** and store it in **This Workbook**. Your macro should record all of the actions in **steps 16–18**.
16. Select **cell A5** and choose **Home→Cells→Insert**.
17. Select **cell K5** and type **`New Event`**.
18. Highlight the **range E5:H5** and apply the **Accounting** format.
19. Stop the macro recording.

Run and Assign Macros

20. Run the macro using the **Run** command in the Macro dialog box.
    Note that a new row is created at the top of the list when the macro is run.
21. Assign the shortcut keystroke Ctrl+Shift+R to the macro.
22. Test the macro using the Ctrl+Shift+R keystroke combination.
23. Delete the three blank rows above the worksheet data.
24. Save as a macro-enabled workbook and then close the file; exit **Excel**.
25. Submit your final file based on the guidelines provided by your instructor.

Extend Your Skills

In the course of working through the Extend Your Skills exercises, you will think critically as you use the skills taught in the lesson to complete the assigned projects. To evaluate your mastery and completion of the exercises, your instructor may use a rubric, with which more points are allotted according to performance characteristics. (The more you do, the more you earn!) Ask your instructor how your work will be evaluated.

EX12-E01 That's the Way I See It

You volunteer at the local animal shelter and, since everyone there knows you are studying Excel, they've asked you to create a workbook displaying information for five new shelter dogs. The worksheet will list the dogs' identifying information and will contain one column that uses a lookup table. Start Excel and create a new workbook named **`EX12-E01-Lookup-[FirstInitialLastName]`** that is saved to your **EX2013 Lesson 12** folder.

The dogs can be placed into four size classifications, namely Small (0–25 lbs.), Medium (26–50 lbs.), Large (51–99 lbs.), and Extra Large (100+ lbs.). Create a worksheet that lists five dogs, the shelter contact's name (use the dogs of friends or celebrities whose information can be readily found on the Internet), and each dog's breed, age, and weight. Then create a table array that lists the four sizes and the weights for each. This table is to be used to create a final worksheet column, within which the appropriate classification is listed for each dog. Finally, create a macro that sorts the data based on one of the existing columns. Ensure that the macro inserts a label describing the type of sort in a logical location.

You will be evaluated based on the inclusion of all elements specified, your ability to follow directions, your ability to apply newly learned skills to a real-world situation, your creativity, and the relevance of your topic and/or data choice(s). Submit your final file based on the guidelines provided by your instructor.

EX12-E02 Be Your Own Boss

In your quest to keep your Blue Jean Landscaping records organized and up to date, you are creating a PivotTable and PivotChart to display a summary of clients' monthly landscaping service costs in each town by lead landscaper name.

Open **EX12-E02-Clients** from the **EX2013 Lesson 12** folder and save as **`EX12-E02-Clients-[FirstInitialLastName]`**. Give the worksheet an appropriate title. Then, create a macro that performs a column sort by town and then by lead landscaper. Assign this macro to shortcut keys. Insert a PivotTable that displays monthly cost totals by town and then by lead landscaper. Create a PivotChart and format it appropriately for size and appearance.

You will be evaluated based on the inclusion of all elements specified, your ability to follow directions, your ability to apply newly learned skills to a real-world situation, your creativity, and your demonstration of an entrepreneurial spirit. Submit your final file based on the guidelines provided by your instructor.

Transfer Your Skills

In the course of working through the Transfer Your Skills exercises, you will use critical-thinking and creativity skills to complete the assigned projects using skills taught in the lesson. To evaluate your mastery and completion of the exercises, your instructor may use a rubric, with which more points are allotted according to performance characteristics. (The more you do, the more you earn!) Ask your instructor how your work will be evaluated.

EX12-T01 Use the Web as a Learning Tool

Throughout this book, you will be provided with an opportunity to use the Internet as a learning tool by completing WebQuests. According to the original creators of WebQuests, as described on their website (WebQuest.org), a WebQuest is "an inquiry-oriented activity in which most or all of the information used by learners is drawn from the web." To complete the WebQuest projects in this book, navigate to the student resource center and choose the WebQuest for the lesson on which you are currently working. The subject of each WebQuest will be relevant to the material found in the lesson.

WebQuest Subject: Effective implementation of PivotTables

Submit your files based on the guidelines provided by your instructor.

EX12-T02 Demonstrate Proficiency

You have been maintaining a donation listing workbook and would like to be able to quickly sort the contents in different ways: 1) in A to Z order based on the patron last names and first names, and 2) in largest to smallest order based on donation details.

Open **EX12-T02-Donations** from the **EX2013 Lesson 12** folder and save it as **`EX12-T02-Donations-[FirstInitialLastName]`**. Create macros that automate the processes described above, and name them Sort_by_Patron and Sort_by_Details, respectively. These macros should each display a description of the sort in cell A16. Be sure to test the macros after they have been created to ensure that they work properly. Insert buttons in an appropriate location on the worksheet, and assign one macro to each.

Submit your final file based on the guidelines provided by your instructor.